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ANNALS OF THE ROYAL OBSERVATORY, CAPE OF GOOD HOPE.

VOL. II. PART II.

REFERENCE CATALOGUE OF SOUTHERN DOUBLE STARS.

COMPILED BY

R. T. A. INNES,

SECRETARY AT THE ROYAL OBSERVATORY, CAPE OF GOOD HOPE.

WITH A PREFACE BY

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ERRATA.

PAGE

2A No. 10, *for* "W. B. 1 h." *read* "W. B. 0 h."

4A „ 27, line 25, *for* "Star" *read* "Stars."

15A Footnote, *for* "M'Clean" *read* "McClean."

49A No. 13, *for* "1″·81" *read* "4″·81."

55A „ 62, *for* "$6^h\ 45^m$" *read* "$6^h\ 44^m$."

62A „ 28, *for* "+" (twice) *read* "*."

96A „ 75, *for* "♅. II. 7·4" *read* "♅. II. 74."

99A „ 5, *for* "Engelman" *read* "Engelmann."

111A „ 41, *for* "La Feuillée" *read* "Père Jean de Fontenay."

148A „ 55, last line, insert a full stop after "See."

160A „ 39, the correct synonym for *h* 4850 is ♅. N. 39. *For* Mag. "5·7" *read* "5·4."

243A *h* 4975 should be struck out; it will be found on page 178A, to which it has been removed on the authority of the observation by Cruls.

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N.—400—11/99. Wt. 4529/934.

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PREFACE.

Up to the present time no general catalogue of the double stars of the Southern Hemisphere has been published. The observer who desired to work in this field of research has, therefore, been compelled either to expend much time in searching for suitable objects in the sky, or to consult and compare many different publications, in order to find the objects most likely to repay labour, with such means as may be at his disposal.

Greater activity may, in future, be confidently looked for in double star work, owing to the increased number of suitable instruments recently erected in the Southern Hemisphere. A strong additional stimulus will undoubtedly be given by the example of Dr See's labours in this comparatively unexplored field, and by the publication of his *Researches on the Evolution of the Stellar Systems.*

The time is therefore opportune for the appearance of a Reference Catalogue of these objects.

Mr R. T. A. Innes, the author of the present work, joined the staff of the Cape Observatory in 1896 as Secretary, Librarian, and Accountant. It formed no part of his official duties either to engage in astronomical observing or to contribute in any way to the publications of the Cape Observatory. But previous to his arrival at the Cape, he had devoted himself to practical astronomy, and, with comparatively feeble means, had discovered about forty new double stars, and published their estimated distances and position angles. He had also made some progress in the preparation of a card catalogue of reference to the known double stars of the Southern Hemisphere. This catalogue he has not only completed within the past two years in the intervals of his leisure time, but he has discovered upwards of 280 new double stars with the 7-inch equatorial, and contributed a large amount of valuable work to the revision of the *Cape Photographic Durchmusterung.*

DAVID GILL.

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INTRODUCTION.

THE object of this compilation is to furnish a reference catalogue of all known double stars having southern declination at the equinox of 1900. But:—What is a double star? Should the wide pairs of the earlier astronomers be indiscriminately included? It is easier to say 'No' to the latter suggestion than to give a definition of what should constitute a double star that will meet all views. A compromise has been adopted: in addition to many rather wide pairs, worthy of inclusion from some point of view, every known southern double star finds a place here, which falls within the limits of distance given in the following table:—

Magnitude of Primary.	Limiting Distance of Components.
1	30″
2	25
3	20
4	15
5	10
6	7
7	5
8	3
9	1

These limits do not exclude any binary pair in either hemisphere. Some systems, much exceeding the above distances and showing no certain signs of orbital motion, have been included on account of the large proper motion common to both components.

In the course of an examination of the southern sky for double stars, the necessity for the construction of a reference catalogue has become more and more evident. In addition, such a catalogue will be found useful when measuring astrographic plates.

The programme adopted by the *Comité International de la Carte du Ciel* requires the selection of ten stars on each plate for meridian observation as points of reference for the remainder. It is obvious that these standard stars should not be double; if the components are not shown separately on the plates, it is inadmissible to assume that the photographic light-centre of gravity, so to speak, agrees with that resulting from eye observation. This objection applies even to optical or fixed pairs. In the case of binary systems, even if both stars are shown on the plates, it is clearly advisable to

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avoid the complications that arise through their introduction. It will be evident that the scheme of this catalogue excludes no double star that would appear single on a good plate; hence it may be found useful when selecting reference stars by showing what stars to avoid.

As a justification for the exclusion of double stars more widely separated than the limits adopted, it may be urged that even if binary, their orbital motion will be extremely slow; unless, indeed, the mass of the system is exceptionally great, or the stars are relatively near to us. All these wide pairs, however, will be found on the catalogue plates of the *Carte du Ciel*, and their positions will in due course be recorded. Repetition of these photographs in future centuries will therefore serve all purposes, or, at least, will indicate those pairs worthy of micrometrical measurement.

The selection having been made on the above principles, the stars were identified in various catalogues, and their positions brought up to 1900·0 to the nearest second of time and tenth of a minute of arc.

The *Cape Photographic Durchmusterung* (1875), from which the places for 1900·0 may be taken out by inspection, has been most useful in affording a ready check on the places of all stars common to the two catalogues.

Nomenclature.

Great care has been taken to name each star after its discoverer, all observations being classified in order of publication. This seems consistent and fair, and it is trusted that the nomenclature adopted will be found satisfactory to astronomers. It has seemed to me that any other method would lead to confusion.* Stars discovered by Herschel, and also measured by Struve, are therefore here referred to by Herschel's designation, and all other cases have been similarly dealt with. In many cases a note has been added to the measures, giving the better known synonyms, and some other synonyms have been included in the indexes on pp. 249A–262A.

In addition to the name adopted by the double star observer, a reference is given to the earliest catalogue in which the star appears. This, however, was not considered an essential point, and exceptions will be found. The order in which the star names were selected was substantially as follows:—

Constellation-named stars.
Auwers's Bradley.
„ Mayer.
Piazzi.
Lacaille.
Brisbane.
Lalande.
Weisse's Bessel.
Oeltzen's Argelander.
Gilliss's Catalogue.
Yarnall (3rd edition).
Cape Catalogue, 1880.
Cordoba Zone Catalogue.
Argentine General Catalogue.
Gilliss's Catalogue of Polar Zones.
Bonn Durchmusterung.
Cape Photographic Durchmusterung.
Cordoba Durchmusterung.

* I consider this nomenclature as only tentative: when the whole heavens have been well explored, and our knowledge of double stars is sufficiently complete to admit of classification, a more satisfactory and impersonal system will doubtless be substituted.

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The full titles and other particulars relating to these works will be found elsewhere.*

It is hoped that by giving the earliest catalogue-name, investigations of proper motion will be facilitated.

Magnitudes.

Much consideration was given to the question of magnitude, the range between different observers being in some cases excessive. It seemed, therefore, desirable to leave the question of magnitude to the uranometries and photometries.† As, however, the photometric observers almost invariably observed the stars as single, it was necessary to make use of the differences of magnitude given by the double star observers. At one time the idea of giving a separate column for the observed differences of magnitude suggested itself. The poorness of the material available led to its omission. It would be an advantage in future observations, while leaving the absolute magnitude of the pair considered as one star to those who devote themselves to this study, to record on each occasion the *difference* of magnitude between the components, provided this difference does not exceed three magnitudes, as beyond this range any approach to a rigorous comparison is out of the question. For very unequal wide pairs, Dawes's method of limiting apertures offers a ready means of determining the magnitude of the companion.

The combined magnitude has therefore been taken from the following authorities in the order in which they are named :—

Southern Meridian Photometry.
Harvard Photometries.
Bonn Durchmusterung (Schönfeld).
„ „ (Argelander).
Cordoba Durchmusterung.
Argentine General Catalogue.
Cordoba Zone Catalogue.
Gilliss's Polar Zones Catalogue (reduced to the Cordoba scale as given in the introduction to the catalogue).

For the very few stars which are not contained in any of the above works, the magnitude necessarily depends on the double star observer's estimate. It has been assumed that no star brighter than $9^m{\cdot}0$ can have been omitted from the Bonn or Cordoba Durchmusterung. If, therefore, a star, not contained in either of these works, is recorded as brighter than $9^m{\cdot}0$, it has been assumed that this estimate is erroneous, and the magnitude amended accordingly. In one or two cases where the Durchmusterung or other authority is palpably in error, attention is drawn thereto.

For the separate magnitude of a companion star, the following formulæ have been applied :—

* See introduction to the *Radcliffe Catalogue* for 1890, or the *Cape Photographic Durchmusterung*, vol. i. pp. (64)–(65).

† It would be as logical for the double star observer to prefer, in place of meridian observations, the readings of the circles of his equatorial, as it is for him to adopt his own estimate of magnitude rather than that of recognised authorities. It seems to be a pretty general rule with all double star observers to over-estimate the brightness of the pairs they discover. This has led to the omission of some pairs, which, on their discoverer's estimate of magnitude, fall within the limits given on page viiA.

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Let

A = Magnitude of the brighter component
B = „ „ fainter „
C = Combined magnitude
D = Difference of magnitudes

then

$$A = C + x$$
$$B = A + D$$

where

$$x = \frac{\mathrm{Log}\left(1 + \frac{1}{2{\cdot}512^{D}}\right)}{0{\cdot}4}$$

assuming a light-ratio of 2·512.

From the last formula, the following table was constructed :—

D	x	D	x
m	m	m	m
0·0	0·8	0·8	0·4
0·1	·7	1·0	·4
0·2	·7	1·5	·2
0·3	·6	2·0	·2
0·4	·6	2·5	·1
0·5	·5	3·0	·1
0·6	·5	4·0	·0
0·7	·5		

Thus, in α Centauri we have

$$C = 0{\cdot}2$$
$$D = 1{\cdot}5$$
$$\therefore \quad x = 0{\cdot}2$$
$$C + x = 0{\cdot}4 = A$$
$$A + D = 1{\cdot}9 = B$$

The inverse case is illustrated by two stars, each of the $6^{m}{\cdot}8$.

$$A = 6{\cdot}8$$
$$B = 6{\cdot}8$$
$$\therefore \quad D = 0{\cdot}0$$
$$x = 0{\cdot}8$$
$$A - x = 6{\cdot}0 = C$$

Although the above table, which depends upon the accepted light-ratio to which the Durchmusterung-magnitudes are supposed to conform, holds good for most pairs, I am convinced that it does not apply to those pairs both components of which are faint. Thus two stars of the 10th magnitude in the Durchmusterung are only equal to one of the 9·7 or 9·8 magnitude instead of 9·2 magnitude as given by the table. It seemed, however, unwise to discuss this question at present, as it did not enter essentially into the construction of this catalogue; for which any system will do, provided that it is uniformly applied, and is one to which all astronomers can easily conform. The value of the light-ratio between the different magnitudes is of such importance in astronomical photography and

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in the study of variables, that it must be left to astronomers dealing with these subjects. When the question is entered into, and a scale of magnitude agreeing with theory has been constructed, it will be a very simple matter to bring the Durchmusterung-magnitudes into agreement therewith. If each double star observer continues to adopt a system of his own, as has been too much the case in the past, it will complicate matters, besides making comparisons between different catalogues more uncertain.

If the stars are so wide as to have been observed separately in any one of the authorities on magnitude, the resulting combined magnitude has first been computed, and then, using the mean of the differences of magnitude given by the various double star observers, the magnitude of each component has been found. If the stars are fairly equal in magnitude and close together, so as to have been observed as one star, reliance has of course to be placed on the estimates of the double star observer for the difference of magnitude between the components. When the companion is small and distant, it is assumed to have had no effect on the estimate of brightness of the chief star ; should, therefore, an observer make the magnitudes of such a pair 5·0 and 8·5, and the chief star in the selected photometry be 5·8 mag. the companion will here on some occasions be altered to 9·3 mag., thus retaining the observed difference.

The cases above considered merge into one another and it would have been difficult to adopt a fixed rule, which indeed has not been attempted.

I have specially examined the magnitudes of many of the stars, and have either adopted my own results, or used them in combination with those of Sir John Herschel and some other observers.

I have not given prominence to the question of the variability of components of double stars—attention has been directed to a few of the more striking cases only. It is highly probable that the variation of light so often recorded is in some cases real. If observers will regularly record the difference of magnitude between the components of pairs as *suggested above*, material will soon accumulate for a satisfactory investigation of the subject. I have found that if a pair is observable, but really too close to be separated with the telescope employed, the smaller component will be estimated considerably under its real magnitude as seen with greater optical power.

When the magnitude of a double star system, as given in the *Cape Photographic Durchmusterung*, differs from the visual, by more than a unit, its photographic magnitude is quoted in the notes appended to the measures. The photographic magnitudes are often fainter than the visual, and this in nearly all cases is due to the yellow or reddish light of the stars, which is well known to have less actinic effect than white light.

Measures.

In a few cases only have all the available observations been quoted. It has been considered sufficient to give such a selection that it can be seen at a glance whether the pair is stationary or in motion—in other words, whether a pair is likely to require or repay further observation. For many of the more southerly pairs showing signs of

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change, the lists of measures will in most cases be found fairly complete. To many well-measured pairs the words "Other measures" have been added.

The measures given are in some cases the means of several observations, and where the original observer has himself given means, others have sometimes been formed in their stead, when it seemed advantageous to do so. Although every care has been taken to insure accuracy in copying, any astronomer pursuing an investigation into the motion of a star would do well to refer to the original authorities. This has been found necessary when consulting lists quoted as complete by their compilers.

Many astronomers have adopted corrections to their observed angles and distances, among them, Otto Struve and the Cincinnati observers; the younger Herschel gave a table to reduce his position angles measured with the reflector to those measured with the refractor. Some, at least, of these corrections are of doubtful utility, but in transcribing the results, they have sometimes been used and sometimes omitted.

When an orbit has been computed for a binary pair, the elements taken from the latest authority, together with some idea of the nature of the apparent orbit, have generally been given. This seems sufficient for the purposes of a working reference catalogue. With great kindness, Professor T. J. J. See offered to lend, for reproduction here, the plates which appeared in vol. i. of his *Evolution of the Stellar Systems*, showing the apparent orbits of several interesting southern binaries. Although their inclusion would have added greatly to the interest of the catalogue, it was decided that they were not essential to its purpose.

Some hitherto unpublished measures will be found herein; for these my thanks are due to Mr Baracchi, the director of the Melbourne Observatory, to my present chief Dr David Gill, and lastly to Professor See, who kindly sent complete lists of all his measures, in advance of publication. Most of the Melbourne measures were made by the former director, Mr Ellery; and the older Cape measures by Sir Thomas Maclear, who used the same instrument with which the double stars contained in the recent lists issued from the Cape Observatory were discovered. Two or three sets of measures (hitherto unpublished) made by myself with the same telescope are also included, as well as many estimates showing in some cases interesting instances of change.*

It is noticeable that the duplicity of many of the stars included, rests on the authority of one observer, and often on observations of one night only. This is a shortcoming that the publication of this catalogue should help to remove. At the end of the catalogue a chronological bibliography of works and observations on southern double stars will be found, which it is hoped will facilitate researches into measures of southern pairs, and form a guide for those who desire to devote their time to measuring wider pairs than are here included.

Notes of a miscellaneous character follow the measures of the more important pairs;

* The clock of the 6·9-inch refractor is faulty, and measures of distance can only be made with great difficulty. Moreover, it seemed advisable, pending the completion of the McClean telescope, to endeavour to find as many new pairs as possible on the few occasions available for such work, instead of making measures of a few pairs under difficulties.

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in particular, they contain, when available, the value of the proper motion reduced to a great circle taken from various authorities, among whom may be mentioned Auwers, Stone, Argelander, Bossert, and Porter. Many proper motions have been computed specially for this catalogue. Owing to lack of material, these are not so complete as could be wished.

Many references to neighbouring stars will also be found, in order to make the identification of the fainter pairs more certain.

Very little attention has been given to colours. Where, however, they seemed generally agreed on, they are quoted. The minute differences of shade recorded by some observers have been omitted as useless if not misleading.

Very few abbreviations have been used; a list will be found on page xviA.

Of the 2140 stars contained in this catalogue, 21% are under 1″ in distance, 24% are between 1″ and 2″, the remaining 55% exceed 2″. The following inference may be drawn from this:—that the pairs under 2″ apart probably exceed in number those between 2″ and 7″, remembering that the latter class can be easily seen, and that with few exceptions all pairs under 2″ distance require special care on the part of the observer to see that they are double.

During the past quarter of a century the only observatory in the southern hemisphere which has systematically devoted a part of its time to double star astronomy is that of Sydney, New South Wales, where, under the direction of Mr H. C. Russell, several valuable series of measures have been made.

The study of double stars will always be interesting from the Newtonian point of view, and in the case of the brighter pairs, the spectroscopic determination of motion in the line of sight will lead to a knowledge of the true position in space as well as of the absolute dimensions of their orbits, and hence their parallaxes. The irregularities of their orbital motions (already ascertained in a few cases, which will multiply as observations grow more precise) indicate the presence of disturbing bodies. For these reasons even the binaries with the best determined orbits deserve careful and regular observation. From the astro-physical point of view, it is hoped that much may be learned from their study. A contracting and rotating mass of gas may eventually reach an epoch when it will become unstable and separate into two or more portions forming a binary system. It is evident that this critical period will depend on the constitution of the body, its speed of rotation, mass, and temperature. Systematic observations, micrometric and spectroscopic, should in time enlighten us on these, at present, obscure subjects. When we are able to arrange the elements of the orbits of say one thousand binary pairs in tabular form, with their spectroscopic history, both of constitution and of radial speed, including for each the proper motion and its solar component, we shall be in a position to attack questions relating to the constitution of the sidereal heavens, which are to-day beyond the realms of reasonable speculation. In this respect the stars of the southern hemisphere offer at least as attractive a field of investigation as those north of the equator. In spite of neglect, the southern systems already exceed in importance those of the north. Among them may be quoted:—

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Sirius.	γ Sextantis.	ξ Scorpii.
α Centauri.	ζ Aquarii.	π Lupi.
γ Virginis.	o_2 Eridani.	β Phœnicis.
γ Lupi.	α Crucis.	ζ Sagittarii.
γ Centauri.	β Muscæ.	etc. etc.
γ Circini.	4 Aquarii.	

It is true that of these α Crucis is not a binary. It is perhaps all the more remarkable for that reason, being one of the brightest stars in the sky, and shown by photography to be surrounded by a cluster or rather by rings of very faint stars, in the centre of which the two large stars are, as far as can be ascertained, absolutely stationary. Are these gloriously brilliant stars devoid of mass, or, if they shine with an intrinsic brilliancy of surface equal to that of Sirius, at what distance must they be apart that gravitational motion becomes too small to be detected even in a century?* Speculation and analogy alike fail us, and a systematic study of all double stars is alone likely to solve these and many other allied questions.

The high eccentricity of the orbits of some double stars, including α Centauri, subjects the internal constitution of the components to different pressures at the times of periastron and apastron. Does this affect their spectra in a measurable degree?

Tidal evolution must have very sensible effects on the orbits of double stars. Will it be possible to measure its effect in increasing the axis major of a pair? For this purpose very accurate measurements of distance are necessary. A favourable example is exhibited in the case of α Centauri, the components of which attain their maximum distance a few years hence. Every expedient to determine this distance with the utmost exactitude should be employed. It is a debt to posterity that we should strive to discharge. If this be done, a repetition of the measures after the lapse of eighty years would be of the highest interest.

The study of double star astronomy in its many aspects thus promises one of the most hopeful aids to a better knowledge of the history of cosmical development. The present work has been undertaken with the desire to facilitate investigation in this field.

My thanks are due to many friends for their encouragement—especially to Dr Gill, without whose help and advice, in many ways, this work would not have been published.

As this work was printed in Edinburgh, Dr Gill kindly wrote to Dr Ralph Copeland, Astronomer Royal for Scotland, asking if he would be good enough to revise the second proofs and pass the work through the press. For undertaking this, and for many valuable suggestions, I cannot sufficiently express my great indebtedness to him.

* The only determination of the parallax of α Crucis is that made by Dr Gill with the Heliometer in 1888–1889. It is still unpublished. The result is

$$\pi = 0''{\cdot}050 \pm 0''{\cdot}018,$$

but this is the parallax with reference to neighbouring stars, which may be at about the same distance as α Crucis.

R. T. A. INNES.

Royal Observatory, Cape of Good Hope,
29th August 1899.

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FORMULÆ, ETC.

The annual precession can be approximately computed by the following formulæ :—

$$\text{In R.A.} = +3^{s}\cdot07 + 1^{s}\cdot34 \sin \text{R.A.} \tan \text{Dec.}$$

$$\text{In Dec.} = +0'\cdot334 \cos \text{R.A.}$$

The change in position angle, due to precession, for one century is equal to :—

$$+0^{\circ}\cdot557 \sin \text{R.A.} \sec \text{Dec.}$$

In this catalogue all position angles are given for the epoch of observation.

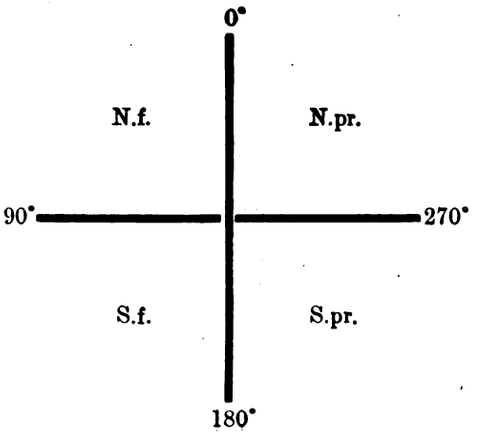
In many of the old double stars, both components will be found in meridian catalogues. If the difference in seconds of R.A. (companion—chief star) be Δ R.A., and the difference of Declination = Δ Dec., the position angle and distance can be found as follows :—

$$\text{Tan (Position angle)} = \frac{15\Delta \text{ R.A.} \cos \text{Dec.}}{\Delta \text{ Dec.}}$$

$$\text{Distance} = \frac{15\Delta \text{ R.A.} \cos \text{Dec.}}{\sin \text{(pos. angle)}} = \frac{\Delta \text{ Dec.}}{\cos \text{(pos. angle)}}$$

These formulæ will also serve to convert proper motion in R.A., and Dec. into proper motion along a great circle.

QUADRANTS.



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ABBREVIATIONS.

N., . . .	North.
S., . . .	South.
pr., . . .	preceding.
f., . . .	following.
p.m., . . .	proper motion (annual).
$H_{\odot}$, . . .	Sir Wm. Herschel.
h., . . .	Sir John F. W. Herschel.
Σ, . . .	F. G. W. Struve.
OΣ, . . .	Otto Struve.
β, . . .	S. W. Burnham.
Cinc., . . .	The observers at the Cincinnati Observatory.
Goodsell, . .	„ Goodsell „
λ, . . .	„ Lowell „
L. McC., . .	„ Leander McCormick Observatory.
Washburn, . .	„ Washburn Observatory.
M.O., . .	Meridian Observations.
* (to position angles),	That the position angle has been altered by ± 180°.
U.A., . . .	Uranometria Argentina.
±, ...	Estimation.

STAR CATALOGUES.

B.D., . . .	Bonner Durchmusterung.
Bris., . . .	Brisbane's Catalogue.
C.G.A., . .	Catálogo General Argentino.
C.Z., . . .	Cordoba Zones.
C.P.D., . .	Cape Photographic Durchmusterung.
Cor. D.M., . .	Cordoba Durchmusterung.
Gilliss P.Z., . .	Gilliss's Polar Zones.
Lac., . . .	Lacaille's B.A. Catalogue.
Lal., . . .	Lalande's „ „
1st Mun., . .	First Munich Catalogue.
Ö.A., . . .	Oeltzen's Argelander (Weisse's edition used, but the old numbers retained).
Pos. Med., . .	Struve's Positiones Mediæ.
Schj., . . .	Schjellerup's Catalogue.
W.B., . . .	Weisse's Bessel (+15° to −15°).

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REFERENCE CATALOGUE

OF

SOUTHERN DOUBLE STARS.

0hrs.

No. 1. λ 1. C. Z. 23 h. 1630. MAG. 8.8
0h 0m 51s — 30° 53′.1.

Comes = 11.4

1896.8	323°.1	4″.73	Lowell	3 n

Ö.A. 23232, mag. 7.5, is 2s.5 pr. and 2′ S.

No. 2. Harvard. Lac. 9721. 5.6
0h 1m 9s — 49° 37′.8.

1891 Double within 30″. Arequipa.
The p.m. of Lac. 9721 is 0″.485 towards 91°.2.

No. 3. Σ 3063. Lal. 47294. 8.7
0h 2m 29s — 5° 6′.0.

8.9 yellowish, and 10.6

1831.5	232°.9	1″.79	Σ	3 n
1865.6	224.4	1.84	Dembowski	4–1
1877.9	223.3	1.82	β	2
1886.7	219.8	1.95	L. McC.	4

Some change.

No. 4. λ 2. Lac. 9732. MAG. 6.0
0h 2m 40s — 23° 3′.9.

Comes = 12.3

1897.7	174°.3	2″.15	See	1 n

No. 5. β 391. κ_1 Sculptoris. 6.0
0h 4m 15s — 28° 32′.5.

6.7 and 6.8

1877.5	277°.1	0″.84	Cinc.	4–3 n
1888.9	272.5	0.94	Haverford	4–3
1894.5	271.6	0.86	Sellors	5
1895.8	271.0	0.93	Aitken	3
1897.1	273.2	1.24	See	3

No. 6. λ 3. C. Z. 0 h. 99. 8.5
0h 4m 46s — 34° 20′.5.

8.8 and 10.4

1896.7	187°.8	1″.15	See	2 n

Wt. 4529/934.—N.—12/1/99.

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No. 7. Innes 43. Lac. 9755. MAG. 6.9
0h 5m 44s — 73° 47′.0.

7.3 and 8.3

1896.7	340.° ±	0.″8 ±	Innes	1 n

The p.m. of this star is about 0″.13 towards 99°.
A physical system.

No. 8. β 486. Lal. 158. 5.8
0h 9m 21s — 8° 20′.2.

Comes = 10.5

1877.9	4.°3	.....	Cinc.	1 n
1878.2	5.0	3.07	β	2
1879.8	6.3	3.05	Cinc.	2
1888.9	5.3	3.09	β	1

No. 9. Σ 15. Lal. 204. 7.6
0h 10m 45s — 6° 9′.4.

7.7 very yellow, and 10.2

1831.2	197.°9	4.″70	Σ	3 n
1896.9	198.1	4.74	Hussey	1

Fixed.
Other measures.

No. 10. Σ 23. W.B. 1 h. 164. 7.7
0h 12m 21s — 0° 14′.3.

7.8 and 10.1, both yellow

1828.5	361.°2	13.″67	Σ	3 n
1854.3	357.4	11.00	O Σ	2
1877.8	350.3	7.92	Cinc.	3
1893.7	340.5	6.05	Glasenapp	1

Many other measures.
Rectilinear motion in the larger star.
The minimum distance, about 3″, will occur about 1940.

No. 11. β 393. Lal. 291. 6.7
0h 13m 13s — 21° 41′.6.

7.0 and 8.3

1878.8	11.°6	0.″69	Cinc.	2–1 n
1886.8	12.6	.....	L. McC.	1
1890.9	16.0	0.71	β	3
1893.9	12.9	0.59	Sellors	2

No certain change.

No. 12. β 256. Anon. MAG. 9.0
0h 14m 2s — 14° 23′.

9.6 and 9.9

1877.9	249.°5	2.″45	Cinc.	1 n
1886.8	248.4	2.70	L. McC.	2

Not in Schönfeld's *Durchmusterung*.
It is therefore assumed that the combined magnitude is not brighter than 9.0.
Other measures.

No. 13. h. 1957. Piazzi 0 h. 51. 7.2
0h 16m 49s — 23° 33′.6.

7.6 and 8.6, both yellow

1846.7	19.°2	6.″29	Jacob	1 n
1851.0	20.9	6.13	,,	2
1869.9	19.5	6.12	Harvard	1
1882.7	22.4	6.34	Cinc.	2–1
1892.9	21.5	5.73	Glasenapp	2
1896.9	22.6	6.11	Scott	2
1897.6	22.6	6.24	See	1

Separately observed on the meridian at Cordoba.

No. 14. h. 3362. Lal. 446. 7.5
0h 18m 22s — 19° 26′.5.

Comes = 11.0

1836.8	73.°3	4.″ ±	*h*	1 n

Identification uncertain, the nearest star to *h*'s position.

1897.9	Not seen.	Innes.

No. 15. β 488. Lal. 465. 7.6
0h 18m 53s — 4° 1′.8.

7.7 and 10.6

1877.7	347.°7	3.″30	β	1 n
1878.6	348.0	3.33	,,	3
1886.7	347.2	3.40	L. McC.	4

No. 16. Cordoba [1]. C. Z. 0 h. 489. 8.7
0h 19m 42s — 33° 53′.5.

9.2 and 9.7

1896.8	118.°)	2.″53	See	2 n

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No. 17. h. 1964. Ö.A. 177. MAG. 8.7
0h 20m 32s — 19° 22′.1.

Comes = 10 0

1831. ±	125°.8	7″. ±	*h*	1 n
1855.8	122.5	6.18	Secchi	1
1876.8	115.6	6.41	Cinc.	1
1895.9	115.7	6.60	Aitken	3

Secchi measures this pair for *h* 3362. See No. 14.

No. 18. λ 5. C. Z. 0 h. 517. 9.3
0h 20m 42s — 35° 22′.9.

9.4 and 12.1

1896.7	73°.5	3″.84	See	2 n

Between two stars, C. Z. o h. 510, mag. 8.7, and C. Z. o h. 526, mag. 9.1.

No. 19. λ—. κ Phœnicis. 3.9
0h 21m 17s — 44° 14′.1.

Comes = 13.0

1897	261°.0	8″.23	See	— n

No. 20. λ 6. α Phœnicis. 2.4
0h 21m 20s — 42° 50′.9.

Comes = 13.0

1897.0	272°.7	9″.73	See	6 n

The p.m. of the chief star is o″.449 towards 155°.4.

No. 21. h. 1968. Lal. 593. 7.3
0h 22m 36s — 16° 57′.8.

7.4 and 10.0

1830	61°.3	20″. ±	*h*	1 n
1877·2	73·1	8.50	Dembowski	4
1895.9	106.7	2.81	Aitken	3

Many other measures.

According to *β* this is probably a case of rectilinear motion in both stars, and the minimum distance 1″.8 will be reached about 1901. (Glasenapp, 2″.3 in 1904.)

Meridian observations of the chief star yield a p.m. of o″.276 towards 85°.2.

An 11.7 mag. star 93″ distant is noted by *β*.

See papers by H. Sadler, *Sidereal Messenger*, vol. v. p. 89, 1886; S. W. Burnham, *M. N. R. A. S.*, January 1891; and S. Glasenapp, *Proc. Russian Astr. Society*, April 1897.

No. 22. Innes 44. Lac. 95. MAG. 8.2
0h 23m 27s — 55° 10′.6.

8.5 and 9.7

1896.8	250°. ±	o″.75 ±	Innes	2 n

Lac. 102, mag. 8.0, is about 14′ N.f.

No determination of the place of Lac. 95 was made between 1751 (Lacaille) and 1875 (Cordoba and Cape), and it was then found that Lacaille's position was erroneous or that there was a large p.m. Dr Gould suggests that perhaps Lacaille's observation got confused with that of Lac. 102. If so, the position agrees with the later determinations to o°.4 and 26″, giving a very doubtful p.m. of o″.2.

No. 23. Russell 3. C. Z. 0 h. 605. 8.0
0h 23m 42s — 66° 27′.9.

8.4 and 9.4

1873.9	120°. ±	1″. ±	Russell	1 n
1887.9	238.8	1.47	Pollock	3–1
1889.9	240.9	1. ±	„	1
1891.9	240.0	1.20	Sellors	2

These are all the measures published.

This is the principal star of the old pair *h* 3370, composed of the two stars C. Z. o h. 605, mag. 8.0, and C. Z. o h. 608, mag. 9.4, which have been measured as follows:—

1834.8	54°.1	25″. ±	*h*	1 n
1873.9	61.9	38·0	Russell	1
1879.9	62.4	38 6	Hargrave	2
1889.8	62.9	39.6	Pollock	2

The change arises probably from p.m.

No. 24. Innes 177. Lac. 113. 8.1
0h 23m 48s — 83° 41′.6.

8.5 and 9.5

1896.8	10°. ±	1″. ±	Innes	1 n

No. 25. h. 322. 12 Ceti. 6.2 **Yellow**
0h 24m 56s — 4° 30′.6.

Comes = 10.9 blue

1866.8	185°.2	8″.66	Dembowski	3 n
1880.2	187.0	8.63	*β*	3

A 10th mag. *comes* 212″ f.

The p.m. is about o″.01.

No sign of change.

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No. 26. β 1158. Lal. 722. MAG. 8.6
0h 26m 1s — 10° 38′.1.

Both = 9.4

1890.91	138°.1	0″.26	β	3 n

Piazzi o h. 96, mag. 7.2, is 79″ S.pr., it has been thought variable.

No. 27. β Toucani. 3.6
0h 26m 58s — 63° 31′.0.

β_2 Toucani = 4.33 S.M.P.
β_1 „ = 4.50 „
Lacaille = $\beta_2 + \beta_1$

1835.8	350°.5	.....	*h* (mirror)	2 n
1835.8	352.3	27.76	*h* (o. g.)	4
1846.9	351.4	26.81	Jacob	2
1851.0	351.2	27.32	„	2
1870.8	350.0	27.51	Russell	1
1878.2	350.6	26.69	Melbourne	5
1880.6	350.7	23.85	Cruls	1
1882.2	350.4	27.32	Tebbutt	1

No change.

The double star observers have generally considered the two components equal in magnitude, or if there is any difference, that β_1 is slightly the brighter star, therein agreeing with the Cordoba estimates. Nevertheless, on the authority of the Southern Photometry of the Harvard Observatory, 180° has been added to all the angles given by the double star observers.

Common p.m. of o″.103 towards 132°.8.

Also registered as Dunlop 1, and in the first Sydney Catalogue of Double Star measured as "*h* 3373 after β Toucani."

In the *Harvard Circular*, No. 18, β_1 Toucani is registered as T (triple or multiple) within 30″, but on examination with the 7-in. no nearer star than β_2 was seen. The latter star is, however, a close double, viz.:—

Innes 260 = β_2 Toucani

4.7 and 5.7

1897.9	300°.±	0″.7 ±	Innes	1 n

Lastly, it may be noted that β_2 is a yellow star, and β_1 white or bluish, like stars of the Sirius or Milky Way type.

No. 28. Innes 45. Lac. 130. MAG. 7.0
0h 28m 49s — 55° 52′.8.

7.2 and 8.6

1896.8	280°.±	0″.8 ±	Innes	1 n

This is the chief star of the pair *h* 3376, *comes* 10.6, mag. measured as follows:—

1837.3	247°.6	7″.60	*h*	2 n
1857.9	247.0	6.26	Jacob	2
1887.9	246.4	6.50	Pollock	2

Probably also seen at Arequipa. See *Harvard Circular*, No. 18, 29th July 1897.

No. 29. h. 3375. Piazzi 0 h. 111. 6.5
0h 28m 50s — 35° 32′.4.

6.7 and 9.2

1835.2	164°.2	6″.45	*h*	3 n
1851.9	165.2	6.40	Jacob	4
1856.0	167.0	5.46	Secchi	1
1877.5	164.5	5.81	Melbourne	2
1877.8	165.8	6.12	Cinc.	2
1879.7	166.7	6.90	β	2
1879.9	166.0	5.16	Hargrave	1
1892.9	168.7	5.60	Glasenapp	2
1893.2	162.5	6.09	Scott	3
1896.8	165.4	6.03	See	2

Change is very doubtful.

Large common proper motion of o″.511 towards 184°.1 proving a physical connection.

No. 30. Secchi 1. Piazzi 0 h. 113. 7.0
0h 29m 23s — 5° 5′.9.

7.4 and 8.2

1858.0	237°.0	0″.4 ±	Secchi	1 n
1867.6	243.1	obl.	Dembowski	2
1871.5	237.6	0.7 ±	„	3
1877.8	241.8	0.89	β	1
1886.7	242.8	0.78	L. McC.	6

This pair and C. G. A. 494, mag. 9.3, 20″ distant, compose the pair H. iv. 76 = Σ 39. All evidently fixed.

Other measures.

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No. 31. β 490. 13 Ceti. MAG. 5.3
0h 30m 6s — 4° 8′.6.

Comes = 13.0

1877.8	65°.3	37″.1	β	1 n
1891.6	58.9	33.7	,,	3

The change is accounted for by the p.m. of the chief star, viz., 0″.397 towards 93°.0. The minimum distance, 19″, will be attained about 1960.

Prof. Hough thought that 13 Ceti was a close pair, but on examination this was not confirmed by β.

No. 32. Russell 4. Lac. 141. 7.6
0h 30m 32s — 54° 6′.0.

8.0 and 8.8

1873.9	91°.3	3″.09	Russell	1 n
1887.9	93.3	2.46	Pollock	2

Separately observed on the meridian at Cordoba.

No. 33. β 395. Piazzi 0 h. 130. 5.6
0h 32m 12s — 25° 19′.0.

6.3 and 6.4

1875.8	135°.±	0″.5 ±	β	1 n
1886.8	104.7	0.65	L. McC.	2
1888.0	109.4	.....	Pollock	1
1889.9	109.6	0.67	Haverford	3–2
1890.0	111.4	0.88	Hall	2
1890.8	112.6	0.74	β	3
1891.8	115.2	0.69	Haverford	1
1891.9	118.2	0.75	β	3
1897.7	276.4	0.23	Lowell	3
1897.9	273.7	0.27	Aitken	3
1897.9	275.1	0.31	Hussey	3

Common p.m. = 1″.359 towards 90°.1

An important binary system, the period being 16.3 years.

See :—Prof. See, "Researches on the Orbit of the New Binary β 395," *Astr. Nachr.*, No. 3455. 1897.

Earlier references to this system are :—

1885. Sadler, H., *English Mechanic*, 29th May.
1886. Burnham, S. W., *Sidereal Messenger*, vol. v. p. 87.

No. 34. Innes 46. Lac. 165. 8.1
0h 35m 13s — 39° 29′.7

8.2 and 10.7

1897.0	310°.±	2″.±	Innes	1 n

No. 35. Σ 49. Lal. 1073. MAG. 7.0
0h 35m 43s — 7° 46′.7.

7.1 yellowish, and 9.5

1830.9	321°.5	4″.49	Σ	3 n
1865.2	319.6	5.24	Dembowski	3
1881.8	321.3	6.10	β	3
1892.9	317.9	5.85	Glasenapp	2

Some increase in distance.

No. 36. h. 3385. Cord. D. M.—41°, 178. 8.7
0h 36m 2s — 41° 45′.3.

9.2 and 9.7

1835.8	242°.9	4″.±	*h*	1 n
1896.9	260.±	4.±	Innes	1

Originally selected as a reference star for one of the Cape Catalogue plates, but rejected when found to be double at the Transit-Circle.

No. 37. h. 3387. ξ Phœnicis. 5.8
0h 37m 14s — 57° 3′.1.

Comes = 10.2

1834.8	252°.1	15″.±	*h*	1 n
1887.4	253.1	12.6	Pollock	3–2

No change.

No. 38. Melbourne 1. Lac. 182. 7.5
0h 37m 27s — 56° 19′.7.

8.5 and 9.0

1877.0	159°.3	7″.06	Melbourne	1 n
1886.9	163.4	7.22	Pollock	1
1887.8	164.0	5.79	,,	2

No. 39. h. 3391. η Phœnicis. 4.5
0h 38m 52s — 58° 0′.7.

Comes = 11.3

1834.8	213°.0	22″.±	*h*	3 n
1887.9	217.7	20.1	Pollock	1

The change may arise from the small p.m. of the chief star = 0″.02 towards 240°.2.

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No. 40. Cordoba [2]. U.A. 64 Toucani. MAG. 6.4
$0^h\ 40^m\ 10^s$ — 63° 2′.7.

6.6 and 8.5

1894.9	90.° ±	3.″ ±	Innes	1 n.

Discovered in 1873.

Registered as a new pair in error, Innes 1 = Bris. 118.

Also in the Arequipa list of new double stars published in *Harvard Circular*, No. 18, July 1897.

No. 41. F. Muller. Piazzi 0 h. 174. 6.5
$0^h\ 40^m\ 42^s$ — 16° 58′.3.

6.6 and 9.6

1887.0	193.°0	2.″48	L. McC.	1 n
1890.0	191.0	2.00	Hough	1

Thought to be new when the latter measure was made and registered as Hough 215.

No. 42. Harvard. Lac. 207. 5.7
$0^h\ 41^m\ 4^s$ — 48° 6′.1.

Noted as double within 30″ at Arequipa in 1891. From *Harvard Circular*, No. 18.

No. 43. h. 3396. C. Z. 0 h. 1057. 9.4.
$0^h\ 41^m\ 18^s$ — 33° 50′.2.

Comes = 10.7

1835.3	217.°0	2.″ ±	*h*	2 n

Seen 1898, not much change, if any; *h*'s distance is too small.

No. 44. β 494. Lal. 1266. 8.5
$0^h\ 41^m\ 54^s$ — 1° 47′.9.

9.2 and 9.3

1877.7	163.°3	1.″42	β	1 n
1878.7	170.6	1.35	„	1
1886.8	171.2*	1.36	L. McC.	3
1888.8	170.5	1.27	Haverford	4
1892.9	171.8	1.37	Glasenapp	2–1

No. 45. Innes 261. Lac. 219. 7.2
$0^h\ 43^m\ 4^s$ — 29° 53′4.

7·8 and 8.1

1897.9	60.° ±	0.″5 ±	Innes	1 n

No. 46. β 301. Lal. 1350. MAG. 8.2
$0^h\ 44^m\ 20^s$ — 21° 56′.5.

Comes = 14.0

1891.79	318.°8	0.″90	β	3 n

This is really a new pair discovered by β with the 36-inch Lick refractor. The chief star of the new pair and a 9·4 mag. star, 11″ N.pr., compose the pair originally called β 301.

β remarks that the close pair is very difficult, the telescope used being the 36-inch Lick refractor.

No. 47. β 1160. Piazzi 0 h. 198. 5.8
$0^h\ 44^m\ 24^s$ — 14° 6′.2.

Comes = 12.0

1890.69	113.°1	1.″19	β	3 n

No. 48. Innes 47. Lac. 236. 6.6
$0^h\ 47^m\ 12^s$ — 44° 15′.1.

7.0 and 7.8

1896.7	355.° ±	1.″8 ±	Innes	2 n

Also noted at Arequipa. See *Harvard Circular*, No. 18, 29th July 1897.

No. 49. Ormond Stone. Lal. 1458. 7.0
$0^h\ 47^m\ 18^s$ — 23° 9′.3.

7.4 and 8.2

1877.8	271.°9	2.″38	Cinc.	5 n
1882.8	274.5	2.42	„	2–1
1886.8	272.0	2.35	L. McC.	3
1891·8	270.5	2.24	Haverford	2
1897.7	267.6	2.25	See	1

This neat pair has a common p.m. of 0″.27 towards 194°.8.

Distance decreasing?

Prof. See also measures an 11th mag. star, 36″ S.pr.

No. 50. β 734. Lac. 238. 5.5
$0^h\ 47^m\ 46^s$ — 24° 33′.0.

5.6 and 8.8

1879.7	348.°9	10.″7	β	3 n
1888.8	346.9	10.8	„	2
1897.6	345.7	11.2	See	1

Mag. in C. P. D. = 6.6.

Noted as a double star at Cordoba in 1873, but β's by priority of publication.

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No. 51. Washington 1. Lac. 241. MAG. 6.6
0h 48m 18s — 25° 19′.3.

6.8 and 8.6

1876.8	11.°8	5.″61	Cinc.	1 n
1877.8	12.6	5.27	„	3
1892.9	10.3	5.57	Glasenapp	2
1896.9	12.6	5.66	Scott	2

Also separately observed on the meridian at Cordoba.

No. 52. Dunlop 2. λ_1 Toucani. 6.6
0h 48m 36s — 70° 2′.7.

6.9 and 8.1 bluish.

1836.3	79.°3	20.″5	*h*	3 n
1852.4	79.3	21.2	Maclear	3–2
1879.9	80.2	20.7	Hargrave	1
1880.2	79.1	20.5	Tebbutt	1

Dunlop gave 71°.6 in 1826 which would seem to be in error.

Erroneously called *h* 3407 in the Sydney list.

h's estimates of the chief star vary from 6.0 to 8.2, and at Cordoba we have:—

1873 = 8.0
1874 = 6.5

No. 53. Gilliss 4. Lac. 247. 7.3
0h 48m 46s — 61° 37′.2.

7.7 and 8.5

1877.0	69.°8	7.″36	Melbourne	1 n
1887.9	71.4	5.51	Pollock	2

Both stars have been observed on the meridian at the Cape and Cordoba.

No. 54. β 233. Ö.A. 505. 8.4
0h 50m 9s — 17° 59′.1.

8.8 and 9.8

1876.8	88.°6*	1.″42	Dembowski	4–3 n
1877.8	87.5	1.29	Cinc.	2
1884.9	91.3	1.53	„	1
1886.6	88.1	1.51	L. McC.	4
1891.8	92.0	1.36	Haverford	2
1892.0	90.5	1.14	β	1
1895.9	96.1	.....	Doberck	3
1897.8	90.0	1.46	See	1

Angle increasing?

A faint pair in the neighbourhood has been measured at Cincinnati.

No. 55. Howe 1. Ö.A. 509. MAG. 8.9
0h 50m 52s — 16° 54′.5.

9.6 and 9.8

1878.7	106.°3	1.″82	Cinc.	1 n
1879.8	105.1	1.72	„	2
1886.4	111.9	1.86	L. McC.	4

No. 56. h. 2004. Lal. 1645. 7.2
0h 52m 41s — 19° 32′.4.

7.3 and 9.9

1851.0	239.°5	3.″20	Jacob	2 n
1869.4	237.7	2.58	Harvard	2
1876.8	240.0	3.33	Cinc.	1
1877.8	242.2	3.11	„	3
1897.8	239.2	3.88	See	1

Fixed.

No. 57. Lalande 4. Lal. 1661–2. 7.3
0h 53m 11s — 16° 13′.4.

8.0 and 8.2

1851.0	215.°0*	6.″37	Jacob	2 n
1877.8	214.9	6.33	Cinc.	3
1881.9	211.7	6.58	Pritchett	3
1885.8	215.2	6.34	Cinc.	4
1892.9	214.0	6.16	Haverford	2

Three nights' observations by Secchi yielding a discordant angle made this pair seem in motion.

Called *h* 1138 by Secchi, but erroneously so.

Separately observed on the meridian at several observatories.

A 7.8 mag. star = Lal. 1648 is S.pr.

No. 58. Innes 48. Lac. 272. 7.2
0h 54m 0s — 67° 6′.0.

7.5 and 8.8

1896.8	342.°±	0.″75±	Innes	2 n

The p.m. is insensible.

No. 59. β 234. Ö.A. 563. 8.4
0h 55m 38s — 17° 37′.6.

Both = 9.2

1875.9	154.°4*	.....	Cinc.	3 n
1877.8	150.9	4.73	„	3–2
1888.0	152.2	4.70	Haverford	2

Ö.A. 565, mag. 9.0, is 40″ distant.

Other measures.

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No. 60. Innes 49. Lac. 278. MAG. 7.0
0h 56m 17s — 53° 7′.3.

7.4 and 8.4, both yellow.

1896.8	40.° ±	0.″8 ±	Innes	1 n
1897.8	45. ±	0.8 ±	,,	1

No. 61. Washburn 62. B.D. —9°, 205. 9.0
0h 57m 2s — 9° 23′.7.

Both = 9.8

1888.8	291.°0	1.″25	Washburn	4–3 n

No. 62. λ 10. Lal. 1823. 8.0
0h 57m 32s — 22° 8′.6.

Comes = 10.3

1897.6	323.°0	4.″94	See	1 n

No. 63. h. 3416. Lac. 297. 6.8
0h 59m 15s — 60° 37′.9.

7.4 and 7.7

1836.1	126.°8	5.″33	*h*	3 n
1851.0	129.1	4.74	Jacob	2
1857.9	129.0	4.81	,,	1
1877.9	129.1*	4.98	Melbourne	4
1880.2	126.2	4.74	Sydney	2

Observed separately on the meridian at the Cape and Cordoba.

No. 64. h. 3415. Lac. 294. MAG. 7.0
0h 59m 19s — 41° 11′.1.

7.3 and 8.6

1834.7	157.°9	0.″8 ±	*h*	2 n
1858.0	152.4	1.28	Jacob	2
1870 / 1877	Divided 140° to 157°,0″.5 to 1″. ±		Russell	4
1882.0	141.9	0.91	Hargrave	1
1895.9	150.3	1.23	Sellors	2

Change doubtful.

No. 65. Ormond Stone. Lac. 296. 6.5
0h 59m 50s — 34° 4′.2

Comes = 10.0

1877.8	219.°1	8.″45	Cinc.	1 n
1879.7	218.4	8.64	*β*	2
1891.8	220.3	8.68	,,	3
1896.9	220.0	8.43	Hussey	1
1896.8	219.4	8.37	See	2

Also registered as *β* 735.

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No. 1. Sellors 1. β Phœnicis. MAG. 3.4
1h 1m 37s — 47° 15′.3.

Both = 4.2

1892.0	26°.3	0″.93	Sellors	1 n
1892.9	24.4	0.92	„	3
1893.9	23.1	0.96	„	5
1894.8	23.1	1.64	Tebbutt	4
1894.9	22.0	1.02	Sellors	3–2

This fine binary system has a p.m. of 0″.062 towards 256°.9.

h noted an 11th mag. companion 30″ N.f. (17°.6). Of the chief star he remarks, "A mere blot," which may refer to bad definition or to his inability to see a neat disc, which should be the case if the two principal stars were then over 1″.5 apart.

This star is included in the Arequipa list of New Double Stars (*Harvard Circular*, No. 18).

No. 2. h. 3418. C.P.D.—58°, 73. 9.0
1h 1m 38s — 58° 25′.8.

9.5 and 10.2

1835.8	252°.6	1″.9 ±	*h*	2 n

Seen in 1898. Not much change if any.
C. Z. 1 h. 1, mag. 8.3, is about 8′ N.pr.

No. 3. β 501. Lal. 1958. 8.0
1h 1m 41s — 5° 11′.0.

Comes = 11.7

1878.5	29°.9	2″.55	β	2 n
1891.9	31.3	2.73	„	3

No. 4. Σ 91. Lal. 1965. 6.8
1h 2m 4s — 2° 16′.0.

7.2 and 8.2, both yellow

1821.9	328°.3	4″.01	Σ	1 n
1831.9	328.8	3.86	„	3
1854.8	323.2	4.03	Dembowski	3
1877.8	321.3	3.92	Cinc.	4
1886.8	321.1	4.12	L. McC.	1
1892.8	321.7	4.05	Haverford	5

Many other measures and meridian observations of both components.

No. 5. Gale. Lac. 342. MAG. 8.2
1h 3m 24s — 83° 47′.4.

8.6 and 9.6

1894.9	0°. ±	0″.8 ±	Gale	—n

No. 6. Innes 262. Ö.A. 655. 7.7
1h 4m 6s — 30° 9′.2.

8.1 and 9.1

1897.9	170°. ±	0″.8 ±	Innes	1 n

No. 7. Sellors 2. Lac. 317. 7.0
1h 4m 7s — 47° 12′.2.

7.1 and 9.6

1892.9	200°.0	1″.09	Sellors	3 n
1893.9	201.4	0.84	„	1

This fine pair follows β Phœnicis, and is more difficult.

No. 8. Rumker 2. ζ Phœnicis. 4.1 Yellow
1h 4m 11s — 55° 46′.8.

C.G.A. 1067 = 8.4 reddish

1835.9	244°.0	6″.27	*h*	2 n
1845.9	241.7	5.88	Jacob	3–1
1851.0	242.3	6.39	„	2
1852.8	244.1	6.00	„	2
1878.0	245.1	6.43	Melbourne	3
1894.9	243.2	6.52	Tebbutt	1

No. 9. Cape 1. C. Z. 1 h. 98. 8.3
1h 5m 0s — 40° 40′.5.

8.8 and 9.3

1896.9	80°. ±	2″.5 ±	Innes	1 n

Found by Mr W. H. Cox at the Transit-Circle.

No. 10. Gilliss 9. Lac. 332. 6.7
1h 7m 4s —73° 29′.4.

Comes = 10.7

1887.9	354°.8	3″.98	Pollock	2 n

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No. 11. Cordoba [3]. C.Z. 1 h. 152. MAG. 8.3
1h 7m 9s — 45° 59′.8.

9.0 and 9.2

1880.8	71°.5	2″.52	C. G. A.	3 n

No. 12. Hl. V. 24. 37 Ceti. 5.0
1h 9m 22s — 8° 27′.6.

Piazzi I h. 22 = 8.2

1782.7	332°.6	45″.9	Hl	1–2 n
1836.0	331.4	50.1	Σ	4
1884.0	331.4	49.7	Pulkowa	2

Relatively fixed.
Common p.m. of 0″.291 towards 16°.3.

No. 13. Innes 27. Lac. 353. 7.3
1h 11m 34s — 69° 21′.0.

7.7 and 8.7.

1896.4	183°. ±	1″.2 ±	Innes	2 n

This pair shares in the p.m. of the next star κ Toucani which is about 5′ 20″ S.f., and with it forms a quadruple stellar system.
(See *Monthly Notices R. A. S.*, vol. lvii. pp. 456–7, 1897).†
Also noted as double at Arequipa. See *Harvard Circular*, No. 18, 29th July 1897.

No. 14. h. 3423. κ Toucani. 4.9
1h 12m 23s — 69° 24′.5.

5.0 and 7.7 purple

1834.9	11°.7	2″.7 ±	*h*	2 n
1836.8	16.0	5.01	,,	2
1871.9	0.0	5.19	Russell	2
1878.0	0.1	4.73	Melbourne	3
1880.6	4.2	4.97	Cruls	1
1887.9	355.7	4.93	Pollock	3
1891.9	356.3	5.41	Sellors	3
1894.9	354.8	5.52	Tebbutt	3

Common p.m. of 0″.407 towards 86°.2.
See also the preceding star.†

No. 15. Innes 50. C. Z. 1 h. 293. MAG. 9.0
1h 12m 42s — 37° 48′.4.

9.4 and 10.4

1896.8	140°. ±	1″. ±	Innes	1 n

Lac. 352, mag. 7.5, is 6 sec. f. and 1½′ N.

No. 16. h. 3426. Lac. 361. 6.2
1h 13m 35s — 66° 55′.5.

6.3 and 9.3

1834.9	341°.7	2″. ±	*h*	1 n
1837.7	348.2	2.52	,,	1
1877.7	340.7	2.52	Melbourne	2–1
1887.9	339.0	1.90	Pollock	2

Some change shown.

No. 17. λ 11. Lal. 2390. 8.2
1h 13m 58s — 27° 2′.1.

8.7 and 9.4

1896.8	315°.8	1″.88	See	2 n
1897.7	313.8	2.07	,,	1

No. 18. Σ 113. 42 Ceti. 6.2
1h 14m 41s — 1° 2′.0.

6.8 and 7.2

1829.9	330°.8	1″.24	Σ	2 n
1833.9	333.9	1.22	,,	7
1836.9	334.3	1.18	,,	3
1863.0	343.0	1.27	Dembowski	6
1881.8	350.2	1.58	β	3
1887.0	349.9	1.28	Hall	3
1893.0	352.9	1.48	Maw	3

Many other measures.
The p.m. is inconsiderable.
Evidently a binary system, but the motion is very slow, the increase in angle being about 1° in three years.

† Nos. 13 and 14. Connecting the chief star of κ Toucani and the optical centre of gravity of Lac 353 we have :—

1874.8	129° 31′	319″.65	Cape M.O.	3 n
1898.2	129 21	319.17	De Sitter	1

the latter measure being made with the Cape Heliometer.

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No. 19. β 1229. C. Z. 1 h. 351. MAG. 7.8
1h 14m 42s — 35° 1′.1.

8.5 and 8.6

1891.8	292.4	1.04	β	3 n
1893.9	293.0	1.02	Sellors	2
1896.8	291.4	1.01	Lowell	3
1898.0	292.6	1.14	Aitken	3

No. 20. λ 12. Lal. 2406. 7.0
1h 14m 43s — 25° 28′.4.

Both = 7.8

1897.7	205.° ±	0.″15 ±	See	1 n

No. 21. h. 2036. Lal. 2416. 6.3
1h 15m 3s — 16° 20′.1.

7.0 and 7.2, both white

1830.8	53.°0	2.″ ±	h	1 n
1836.3	41.5	1.53	,,	2
1851.9	40.7	1.89	Jacob	2
1854.9	40.2	1.65	Cape	1
1858.0	36.1*	1.57	Jacob	3
1875.1	26.5	1.54	Dembowski	2
1877.2	23.3	1.47	,,	3
1877.5	26.7	1.47	Cinc.	6
1882.8	26.0	1.87	,,	1
1886.5	20.6	1.65	L. McC.	5
1888.7	19.7*	1.70	Haverford	3
1892.9	17.8	1.16	,,	2
1895.9	14.1	.....	Doberck	5
1897.9	17.0	1.44	Hussey	2

Also registered as β 110.
Variability suspected.
A binary system.
A few other measures.

No. 22. h. 3430. Lac. 369. 6.8
1h 16m 29s — 57° 52′.0.

6.9 and 10.2

1834.8	251.°7	1.″5 ±	h	1 n
1858.0	246.3	2.0 ±	Jacob	3
1889.8	238.6	1.86	Pollock	1
1894.9	230. ±	2. ±	Innes	1

Some change.

No. 23. λ 13. Lal. 2474. MAG. 8.0
1h 16m 59s — 24° 39′.2.

8.5 and 9.0

1897.6	306.°0	0.″24	See	1 n

No. 24. h. 2043. Lal. 2498. 6.9
1h 17m 40s — 19° 36′.1.

7.0 and 9.4

1846.8	76.°4	4.″89	Jacob	2 n
1879.8	73.0	5.26	Cinc.	2
1892.9	73.8	4.98	Glasenapp	3
1897.8	74.9	5.59	See	1

Separately observed on the meridian at Cordoba.

No. 25. Secchi 2. Piazzi 1 h. 68. 6.8
1h 18m 49s — 24° 52′.5.

7.0 and 8.9

1856.0	83.°5	2.″93	Secchi	1 n
1878.8	79.7	2.50	Cinc.	2
1886.8	80.8	2.69	L. McC.	3
1889.0	81.1	2.98	Haverford	2–1
1897.7	82.5	2.84	See	2

Separately observed on the meridian at Cordoba in 1877.

Although not likely, this may be the pair *h* 3429 with errors of -2^m and $+20'$ in R.A. and Dec. *h* gives:—1834, 15° ±, 5″ ±, mags. 7 and 9.5. It is as *h* 3429 that Secchi measured the above pair.

No. 26. Innes 263. Lac. 399. 7.2
1h 18m 58s — 70° 14′.5

7.7 and 8.2

1897.9	52.° ±	0.″65 ±	Innes	2 n

No. 27. β 1163. W.B. 1 h. 271. 6.0
1h 19m 19s — 7° 26′.2.

6.7 and 6.9

1890.68	192.°3	0.″19	β	3 n

The p.m. is very small.

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No. 28. Σ 120. Lal. 2582. MAG. 7.0
1h 19m 58s — 6° 28′.1.
Comes = 10.4

1831.6	280°.7	7″.06	Σ	3 n
1867.1	279.7	7.14	Dembowski	3
1877.9	278.6	7.47	Cinc.	1

No. 29. β 399. Lal. 2675. 6.2
1h 22m 47s — 11° 25′.2.
Comes = 9.7

1876.5	302°.8	1″.39	Dembowski	2 n
1877.7	301.2	1.89	,,	1

No other measures found.
First seen by β in Dec. 1873.

No. 30. β 1230. Piazzi 1 h. 99. 6.1
1h 25m 40s — 26° 43′.4.
Comes = 11.6

1891.84	224°.5	2″.62	β	4 n

Mag. in C. P. D. = 7.4.

No. 31. Innes 264. Lac. 446. 8.0
1h 27m 36s — 53° 53′.1.
Both = 8.8

1898.0	310°. ±	0″.5 ±	Innes	3 n

An 11th mag. star 20″ ± N.?

No. 32. Howe. W.B. 1 h., 457. 8.5
1h 28m 37s — 12° 43′.5.
9.1 and 9.5

1877.8	330°.1	0″.88	Cinc.	2–1 n
1885.8	329.6	0.87	,,	1
1886.7	327.6	0.85	L. McC.	1

No. 33. Innes 51. Lac. 460. 7.0
1h 30m 6s — 46° 12′.4.
7.1 and 9.9

1896.8	15°. ±	1″.4 ±	Innes	2 n

No. 34. β 1000. Lac. 458. MAG. 7.4
1h 30m 23s — 30° 25′.6.
Comes = 11.0

1881.8	336°.4	1″.80	β	2 n
1891.8	356.4	1.44	,,	3
1897.9	350. ±	1.5 ±	Innes	1

There is an 8.7 mag. star 142″ distant.

No. 35. h. 3447. τ Sculptoris. 5.7
1h 31m 31s — 30° 25′.2.
6.1 and 7.1

1837.2	75°.4	3″.35	*h*	2 n
1846.3	82.4	2.90	Jacob	2
1851.0	82.5	2.62	,,	2
1852.9	82.5	2.50	,,	3
1877.8	90.1	2.20	Cinc.	3
1878.0	90.1	2.43	Melbourne	2
1881.8	87.3	2.19	β	3
1889.0	93.2	2.16	Hall	2
1894.9	91.3	2.09	Tebbutt	4
1896.8	92.6	2.01	See	2

In 1882 this star was looked for at Sydney and "not divided" on one night by Hargrave. It is almost certain that some other star was examined.

Some decrease in distance with the increase in angle.

No. 36. Pollock [1]. Lac. 483. 8.0
1h 34m 29s — 45° 6′.3.
8.7 and 8.8

1887.9	37°.8	1″.02	Pollock	2 n
1889.9	38.3	1.25	,,	1
1893.9	39.3	1.12	Sellors	1

No. 37. Dunlop 5. p Eridani. 5.3
1h 35m 59s — 56° 42′.2.
6.0 and 6.1

1834.8	302°.3	3″.65	*h*	5 -2 n
1849.8	269.4	4.38	Cape	1
1854.9	262.6	4.44	,,	2
1861.0	253.4	4.86	Powell	6–4
1870.9	242.1	5.46	Russell	1
1877.9	236.0	6.36	Ellery	2
1886.9	230.3	6.76	Pollock	2
1890.9	226.7	6.84	Sellors	
1896.9	223.4	7.40	,,	

Many other measures.

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The first observation of this star by James Dunlop is to be found in vol. iii. of the *Mem. R. A. S.*, p. 259, and is here quoted in full:—

"Double, both of the small 6th magnitude. December 1825.

	Position. rev.	div.
	3	2,0 n.f.
	3	2,5
	3	4,0
Mean =	3	2,8
Position	73° 6′	

"A beautiful double star, both stars white; the preceding a little dusky. I cannot say which of the stars is the larger; perhaps the following if there be any difference. The distance is about equal to one diameter of the following star, which I estimate at 2½ seconds."

Dunlop's position circle seems to have been rotated by means of a divided head, of which one revolution was equal to 24° and one division equal to 24′.

The angle 73°.1 n.f. corresponds to 16°.9 in the ordinary way of reckoning, but it is suggested that n.p. was really meant, and that the angle should be 343°.1. With this angle Mr J. E. Gore finds the following orbit, using modern observations to 1886.

T = 1823.55
P = 302.37 years.
a = 6″.96
e = 0.674
i = 38°.5
Ω = 135°.0 (1870)
λ = 240°.0

The representation of observations to 1897 with these elements is practically perfect.

It has, however, been considered that one star is passing another by proper motion. This is equivalent to rejecting not only Dunlop's observation but also all made by *h* (eight extending over three years).

A careful discussion of all the meridian observations, which unfortunately end in 1881, yields the following proper motions:—

	R.A.	Dec.
Preceding star,	+ 0s.035	+ 0″.09
Following „	+ 0 .031	− 0 .07

or the mean point has a p.m. along a great circle of

0″.27 towards 87°.9

Considering all the circumstances, it seems, very probably, that this is a binary system, interesting on account of its p.m. and large semi-axis major.

Assuming that the mass of this system is equal to that of the Sun, the parallax would be 0″.16.

The distance will increase slowly for the greater part of a century.

The following papers may be consulted:—

1877. Doberck, W., "Orbit." *Astr. Nach.*, *Nrs.* 2148 and 2168.
1881. Russell, H.C., "Motion," *M. N. R. A. S.*, vol. xli. pp. 166–7.
1883. Downing, A. M. W., "Orbit," *M. N. R. A. S.*, vol. xliii. pp. 263–266.
1887. Gore, J. E., "Orbit," *M. N. R. A. S.*, vol. xlviii. pp. 26–27.
1893. Burnham, S. W., "Motion," *Astronomy and Astrophysics*, vol. xii. pp. 587–8.

No. 38. λ 15. Piazzi 1 h. 153. MAG. **7.8.**
1h 36m 25s — 22° 13′.5.

8.1 and 9.7

1897.7	311°.1	2″.74	See	1 n

No. 39. h. 2072. Lal. 3138. 8.6
1h 36m 43s — 18° 29′.6.

9.0 and 10.0

1831	278°.2	3″.±	*h*	1 n
1868.9	283.7	4.04	Harvard	3–2
1877.8	282.8	3.05	Cinc.	3
1886.7	283.6	3.39	L. McC.	1–2

An uninteresting pair, *h* 2067, will be found, 2m 13s pr. 12′ N.

No. 40. Lalande 8. Lal. 3137. 5.9
1h 36m 49s — 11° 49′.1.

6.2 and 7.5

1831.9	88°.2	4″.01	Σ	5 n
1851.9	88.1	4.30	W. Struve	1
1857.0	89.6	3.78	Morton	2
1867.1	87.7	3.50	Dembowski	4
1877.9	86.5	4.00	Cinc.	3
1884.9	88.0	3.52	Seabroke	1
1886.7	87.4	3.69	L. McC.	7
1892.9	90.4	3.29	Glasenapp	2
1895.9	88.5	3.46	Doberck	4–3

Fixed in angle.
Common p.m. of 0″.424 towards 172°.0.
Also registered as Σ 147.

No. 41. Russell 11. Lac. 521. 8.2
1h 38m 0s — 76° 31′.6.

Both = 9.0

1873.9	126°.9	1″.94	Russell	1 n

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No. 42. Sellors 3. C. Z. 1 h. 997. MAG. 9.2
1h 39m 16s — 55° 21′.6.

Both = 10.0

1893.0	179°.3	1″.±	Sellors	1 n

No. 43. Gilliss 14. Lac. 561. 7.2
1h 39m 18s — 82° 47′.2.

7.7 and 8.2

1887.9	53°.0	6″.02	Pollock	2 n

Separately observed on the meridian at Cordoba.

No. 44. β 6. Lal. 3205. 7.0
1h 39m 43s — 7° 16′.1.

7.1 and 9.9

1875.5	167°.1	2″.59	Dembowski	4 n
1886.9	166.1	2.62	L. McC.	2
1888.7	167.6	2.65	Haverford	3–2

An 8.3 mag. star is 6′.3 due N.

No. 45. h. 3464. Lac. 534. 7.8
1h 39m 48s — 76° 44′.9.

8.0 and 9.7

1836.9	156°.3	2″.2 ±	*h*	1 n
1873.9	160.3	3.73	Russell	1

Separately observed on the meridian at Cordoba.

No. 46. h. 3461. ε Sculptoris. 5.2
1h 40m 58s — 25° 33′.1.

Comes = 9.2

1836.5	69°.6	5″.53	*h*	2 n
1877.6	60.2	4.80	Cinc.	4–3
1879.0	61.1	4.28	β	1
1887.1	61.0	4.55	Hall	4
1897.6	51.6	4.91	See	1

Angle and distance perhaps decreasing.

It is a physical system on account of the common p.m. of 0″.137 towards 121°.1.

In the C. P. D. the combined mag. is 6.4 indicating colour.

No. 47. β 871. Lal. 3289. MAG. 8.0
1h 42m 50s — 1° 27′.3.

8.4 and 9.1

1879.9	352°.6	1″.88	β	4 n
1886.6	351.3	2.28	L. McC.	3
1888.3	352.0	1.97	Haverford	3–2

No. 48. Innes 52. C. Z. 1 h. 1092. 8.5
1h 43m 31s — 44° 28′.2.

9.0 and 9.5

1896.8	180°.±	1″.±	Innes	1 n

The pr. of 3 stars in a curve.

No. 49. Triple. Pos. Med. 157. 8.1
1h 43m 41s — 1° 55′.3.

A and B = Σ 171

8.9 and 9.0

1829.9	157°.6	27″.9	Σ	2 n
1865.1	159.0	29.1	Dembowski	4
1879.9	159.5	29.7	β	4
1891.9	159.9	30.2	„	3

Angle and distance increasing.

B and C = β 511

9.0 and 12.5

1878.2	316°.0	3″.69	β	3 n
1891.9	317.4	3.91	„	3

No. 50. β 1001. Lal. 3339. 8.0
1h 44m 3s — 18° 52′.6.

Comes = 11.5

1881.8	2°.7	1″.32	β	3 n

Lal. 3363, mag. 7.9, is 7′ S.f.

No. 51. β 1168. Schj. 534. 8.1
1h 44m 47s — 10° 52′.1.

8.7 and 9.0

1890.71	203°.0	0″.32	β	4 n

This close pair is 1m 44s pr. 2′.4 S. of ζ Ceti, mag. 3.8; and 19′ N.f. χ Ceti, mag. 4.8.

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No. 52. h. 3469. Piazzi 1 h. 188. MAG. 6.4
1h 45m 30s — 38° 54′.4.

Comes = 10.2

1837.8	70°.9	2″.2 ±	*h*	1 n

The only observation found.
The p.m. of the larger star is 0″.26 towards 360°.
h remarks, "Must be verified."
No companion seen here 1897.9.

No. 53. β 259. W.B. 1 h. 805. 8.0
1h 47m 29s — 10° 13′.6.

8.2 and 9.7

1875.8	236°.0	4″.51	Dembowski	3 n
1877.9	237.5	4.29	Cinc.	3
1889.0	239.7	4.52	Haverford	2–1

No. 54. β 183. Lal. 3487. 8.2.
1h 48m 20s — 17° 13′.5.

8.4 and 10.2

1874.7	226°.4	2″.79	Dembowski	1 n
1875.9	226.4	1.6 ±	Cinc.	1
1879.8	226.7	2.42	,,	1
1885.9	227.5	2.40	L. McC.	1

Other measures.

No. 55. h. 3473. χ Eridani. 3.6
1h 52m 4s — 52° 6′.4.

Comes = 12.0

1834.8	193°.9	12″. ±	*h*	1 n

The companion was not seen in 1896 with the 6.9 – in. Merz refractor.*
The p.m. of the chief star is 0″.667 towards 67°.4 or more than 40″ since *h*'s measure.

No. 56. h. 3475. Lac. 584. 6.4
1h 52m 6s — 60° 48′.0.

7.0 and 7.4

1837.4	37°.6	3″.36	*h*	2 n
1851.0	43.5	2.5 ±	Jacob	2
1858.0	39.4	2.43	,,	2
1870.9	42.3	3.04	Russell	2
1879.0	45.3	2.45	Melbourne	1
1882.0	35.9	2.04	Russell	1
1890.9	47.9	1.97	Sellors	2

Registered as Russell 12 in 1880.
Separately observed on the meridian at Cordoba.

No. 57. Cape 2. C.P.D.—42°.184. MAG. 9.0
1h 52m 30s — 42° 51′.5.

9.6 and 10.0

1897.8	250°. ±	3″. ±	Innes	1 n

Found by Mr A. Cochrane when observing the star in the Transit-Circle.

No. 58. β 7. 58 Ceti. 6.7
1h 52m 54s — 2° 32′.8.

Comes = 11.4

1875.5	12°.1	2″.86	Dembowski	3 n
1877.8	12.9	2.79	Cinc.	3
1880.9	12.8	2.73	β	2
1886.9	10.9	3.10	L. McC.	3

"Very delicate and difficult":—β.
Considered a test for a 6-inch refractor.
The p.m. is about 0″.02.

No. 59. Cordoba [4]. C.Z. 1 h. 1386. 8.1
1h 53m 44s — 52° 41′.1.

8.3 and 9.9

1887.9	40°.7	3″.96	Pollock	2 n

Separately observed on the meridian at Cordoba in 1880.

No. 60. β 514. Lal. 3698. 8.4
1h 54m 55s — 13° 48′.2.

Comes = 11.3

1877.7	135°.3	6″.20	β	1 n
1891.9	134.2	6.36	,,	3

Lal. 3692, mag. 7.0, is 33′ S. pr.

No. 61. Innes 265. Lac. 604. 8.0
1h 56m 50s — 44° 18′.8.

8.4 and 9.4

1897.9	20°. ±	0″.6 ±	Innes	1 n

* 1898.8 – Seen in the Cape 18-in. M'Clean refractor. Apparently unchanged.

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No. 1. β 516. Lal. 3851. MAG. 8.3
$2^h\ 0^m\ 7^s$ — 1° 26′.8.
8.9 and 9.2

1877.9	285°.0*	1″.07	β	2 n
1886.8	287.4	0.84	L. McC.	3
1888.9	282.6	0.69	Haverford	3

Distance decreasing?

No. 2. λ 16. Ö.A. 1300. 8.0
$2^h\ 1^m\ 20^s$ — 22° 37′.8.
8.4 and 9.4

1897.7	36°.1	0″.54	See	2 n

No. 3. Lalande 12. Lal. 3952. 7.8
$2^h\ 3^m\ 36^s$ — 0° 54′.6.
8.1 and 9.3, both white

1832.4	250°.0	4″.78	Σ	4 n
1867.6	248.8	4.69	Dembowski	4
1877.8	247.6	4.98	Cinc.	3
1892.9	249.1	4.68	Haverford	2

Also known as Σ 218.
An 8.3 mag. star is 17 secs. pr.

No. 4. H.IV. 25. 66 Ceti. 5.6
$2^h\ 7^m\ 41^s$ — 2° 51′.7.
Companion = 8.7

1821.0	225°.8	16″.34	Σ	2 n
1834.2	229.2	15.47	„	8
1852.2	229.9	15.55	OΣ	6
1864.9	229.1	15.60	Dembowski	5
1882.7	231.7	15.99	Cinc.	1
1884.9	231.5	15.99	„	2

Common p.m. of 0″.359 towards 98°.2.
Also known as Σ 231.

No. 5. h. 3485. Lac. 668. 8.1
$2^h\ 7^m\ 45^s$ — 49° 48′.2.
8.6 and 9.3

1836.9	143°.0	3″.±	h	1 n
1853.0	139.3	4.51	Jacob	3
1878.0	S.f.	5.±	Cordoba	3

No. 6. h. 3488. C. Z. 2 h. 237. MAG. 8.2
$2^h\ 9^m\ 32^s$ — 62° 7′.4.
8.7 and 9.2

1835.8	134°.8	5″.83	h	2 n
1875.4	137.5	4.86	Sydney	2
1878.0	136.0	4.86	Melbourne	2

No. 7. Innes 266. Lac. 691. 7.6
$2^h\ 10^m\ 21^s$ — 66° 37′.4. Yellow
Comes = 11°.0

1897.9	160° ±	3″.±	Innes	1 n

No. 8. Hastings 1. Lal. 4219. 7.5
$2^h\ 11^m\ 4^s$ — 18° 42′.0.
8.1 yellowish, and 8.4 greenish

1879.9	311°.8	2″.22	Hall	2 n
1885.0	333.4	2.29	„	3
1886.9	337.0	2.15	L. McC.	3
1887.1	338.9	2.18	Hall	4
1888.7	339.6	2.18	Haverford	9–8
1891.0	341.4	2.21	β	3
1891.0	343.6	2.06	Hall	3
1891.5	341.0	2.22	Haverford	6–4
1897.0	346.0	1.94	Aitken	2

Common p.m. of 0″.229 towards 180°.

No. 9. Cordoba [5]. C. Z. 2 h. 314. 8.5
$2^h\ 12^m\ 38^s$ — 33° 27′.5.
9.2 and 9.3

1897.7	270°.1	2″.25	See	1 n

No. 10. Ormond Stone. C. Z. 2 h. 322. 7.4
$2^h\ 13^m\ 4^s$ — 31° 11′.0.
7.8 and 8.8

1877.9	202°.6	3″.02	Cinc.	2 n
1879.7	204.5	3.09	β	4–3
1885.8	202.3	2.73	Cinc.	2

Noted as a double star at Cordoba about 1874.
Also registered as β 737.
The estimated magnitude of A ranges from 6.5 to 8.5, and for B from 7.5 to 9.5.

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No. 11. h. 3494. Lac. 702. MAG. 8.0
2h 15m 36s — 35° 54′.3.

8.7 and 8.8

1837.9	122°.6	1″.5 ±	*h*	3 n
1852.8	110.0	1.96	Jacob	2–1
1877.8	88.2	1.54	Cinc.	1
1887.9	75.6	1.42	Pollock	1
1893.0	67.6	0.98	Sellors	2
1897.7	62.1	1.28	See	1

Separately observed on the meridian at Cordoba in 1875, and noted as "elongated" at the Sydney Observatory in 1880.

A binary system, the motion at present being about 1° per annum.

Registered as a new pair by Prof. See, who identifies it with a star (C. Z. 2 h. 402) some way N.f.

No. 12. Harvard. Lac. 717. 5.4
2h 16m 40s — 56° 24′.3.

Recorded as double at Arequipa.

See *Harvard Circular*, No. 18.

The nearest star seen with the Cape 7-inch is a 10th mag. 30″ at about 90°, and measured sixty years ago as *h* 3497.

Mag. in C.P.D. = 7.2.

No. 13. Innes 147. Cape 1880. 943. 7.7
2h 17m 53s — 48° 46′.1.

7.8 and 10.0

1897.1	340°. ±	0″.8 ±	Innes	1 n

No. 14. Hough 313. W.B. 2 h. 249. 8.3
2h 18m 21s — 8° 16′.3.

8.9 and 9.3

1890.0	75°.7	1″.42	Hough	2 n

A 13th mag. star 15″ distant.

Hough 314, is 43 secs. f. 3′ S.

No. 15. β 738. Lac. 720. 7.5
2h 18m 53s — 30° 19′.2.

8.0 and 8.5

1879.7	182°.6	0″.64	β	2 n
1891.8	174.3	0.55	,,	3

"A close and difficult pair":—β.

No. 16. Hough 314. W.B. 2h. 264. MAG. 8.9
2h 19m 5s — 8° 19′.0.

9.1 and 10.9

1890.0	198°.4	3″.95	Hough	2 n

See also No. 14 = Hough 313.

No. 17. β 739. Ö.A. 1542. 7.8
2h 20m 26s — 30° 18′.7.

8.4 and 8.7

1879.7	264°.5	2″.13	β	3 n
1891.8	266.0	1.45	,,	3
1897.0	261.4	1.69	Aitken	2

First noticed as a double star at Cordoba in 1878.

See also No. 15 = β 738.

No. 18. β 519. Lal. 4628. 8.3
2h 24m 39s — 2° 42′.7.

8.8 and 9.5

1877.9	57°.7*	0″.97	β	1 n
1878.4	58.8	0.80	,,	2
1886.6	55.2	1.17	L. McC.	4–3
1891.9	59.4	0.69	β	2

No. 19. Howe 3. B.D.—8°, 470. 9.1
2h 26m 40s — 8° 2′.3.

9.8 and 9.9

1877.3	205°.1	2″.21	Dembowski	2 n
1877.8	207.2	2.16	Cinc.	3
1885.8	208.3	2.27	,,	2
1886.7	206.4	2.53	L. McC.	4
1889.0	210.5	.....	Haverford	1

Change doubtful.

No. 20. Σ 280. Lal. 4773. 7.0
2h 29m 8s — 6° 4′.5.

7.7 and 7.9

1831.2	349°.8	3″.77	Σ	3 n
1856.7	345.9	3.90	Dembowski	1
1879.7	346.7	3.52	Cinc.	2
1886.7	346.3	3.73	L. McC.	4–3
1892.8	345.8	3.30	Haverford	2

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No. 21. h. 3506. ω Fornacis. MAG. 4.8
2h 29m 28s — 28° 40′.3.

4.9 white, and 7.9 blue

1835.9	241°.1	5″.±	*h*	1 n
1858.0	242.8	10.7	Jacob	2
1876.0	241.8	11.7	Cinc.	3
1884.8	244.4	10.8	,,	1
1897.7	243.2	11.1	See	1

No. 22. β 520. Lal. 4858. 8.3
2h 31m 49s — 4° 0′.0.

8.5 and 10.0

1879.99	214°.7	0″.78	β	1 n
1886.93	199.8	0.89	L. McC.	1

An 8.3 mag. star is 22′ S.f.

No. 23. Hough 315. W.B. 2 h. 537. 8.7
2h 33m 53s — 2° 1′.1.

9.4 and 9.6

1891.9	359°.2	1″.04	Hough	2 n

An 8.0 mag. star is 32 secs. pr. 10½′ N.

No. 24. Innes 53. Cor. D.M.—40°, 686. 9.6
2h 35m 40s — 40° 23′.6.

10.1 and 10.8

1896.9	325°.±	2″.±	Innes	2 n

Closely N.pr. C. Z. 2 h. 953, mag. 8.3; and ι Eridani, mag. 4.2, is N.f.

This pair can be clearly distinguished on a Cape Photo. Plate.

No. 25. λ 19. Lal. 5005. 7.7
2h 36m 3s — 24° 33′.9.

8.2 and 8.7

1897.7	323°.8	0″.57	See	1 n

No. 26. Σ 295. 84 Ceti. MAG. 6.2
2h 36m 6s — 1° 7′.3.

6.3 and 8.8

1829.8	335°.1	4″.60	Σ	2 n
1834.0	334.2	5.10	,,	2
1856.5	326.5	4.82	Pulkowa	3
1864.0	324.7	4.63	Dembowski	3
1881.8	324.5	4.70	β	2
1888.7	323.0	4.27	Haverford	2

Common p.m. of 0″.135 towards 152°.

No. 27. β 261. Lac. 846. 7.0
2h 39m 24s — 28° 19′.4.

7.1 and 9.8

1876.8	100°.5	2″.98	Cinc.	5–3 n
1884.8	99.8	2.90	,,	2
1891.7	100.1	2.77	Haverford	1

Separately observed on the meridian at Cordoba. There is another pair S.f. See No. 29.

No. 28. h. 3527. Piazzi 2 h. 173. 6.2
2h 39m 27s — 40° 57′.2.

6.9 and 7.1, both white

1836.6	43°.2	1″.47	*h*	3 n
1845.8	46.0	1.3 ±	Jacob	1
1851.0	45.0	1.5 ±	,,	2
1880.0	43.6	1.41	Hargrave	1
1895.9	44.5	.....	Doberck	5

This fine pair shows no sign of change.

No. 29. Howe. Ö.A. 1780. 8.6
2h 39m 37s — 28° 51′.7.

9.1 and 9.6

1878.4	352°.4	3″.70	Cinc.	2 n

Separately observed on the meridian at Cordoba.

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No. 30. β 83. Lal. 5140. MAG. 7.7
2h 41m 0s — 5° 22′.7.

8.0 and 9.3

1872.±	123°.±	1″.3 ±	β	1 n
1876.0	121.3	1.40	Dembowski	4
1877.9	122.2	1.01	Cinc.	2
1888.9	109.4	1.01	Haverford	2–1
1891.8	111.7	0.90	β	3
1892.2	115.6	0.97	Haverford	3

The angles seem irreconcilable.

No. 31. Innes 267. C.Z. 2h. 1123. 8.0
2h 41m 48s — 41° 39′.2.

8.4 and 9.4

1898.0	[40°.±]	1″.±	Innes	1 n

The N.f. of a finder pair.

No. 32. Innes 28. Bris. 410. 8.5
2h 42m 4s — 67° 42′.4.

Comes = 11.1

1895.8	.....	3″.±	Innes	1 n

No. 33. β 1002. Lal. 5198. 8.0
2h 42m 26s — 15° 47′.8.

8.1 and 11.3

1881.8	333°.7	1″.78	β	3 n

No. 34. Leavenworth. Ö.A. 1817. 8.8
2h 43m 0s — 18° 44′.2.

Comes = 12.2

1886.8	24°.6	3″.08	L. McC.	2 n

The brightest of a group of three stars.

No. 35. Triple. C.Z. 2h. 1201. 9.0
2h 44m 20s — 60° 34′.0.

A = 9.5 B = 10.0 C = 9.7
A and B, both yellow = Innes 268

1897.9	250°.±	0″.8 ±	Innes	1 n

A + B and C = *h* 3534

1836.8	213°.1	25″.±	*h*	1 n
1897.9	220.±	15.±	Innes	1

h's dec. is 10′ in error.

No. 36. Σ 315. Lal. 5253. MAG. 8.0
2h 44m 29s — 10° 57′.9.

8.3 and 9.5

1832.0	160°.2	2″.52	Σ	3 n
1865.9	156.7	2.30	Dembowski	3
1878.9	157.0	2.50	Cinc.	2
1892.8	156.8	2.46	Haverford	2

No. 37. h. 3532. Piazzi 2 h. 194. 6.7
2h 44m 38s — 37° 49′.1.

6.9 and 8.4

1837.9	149°.7	8″.±	*h*	2 n
1877.7	145.6	5.36	Cinc.	1
1880.0	146.2	5.22	Hargrave	1
1893.3	144.8	5.29	Scott	5
1895.9	148.0	.....	Doberck	2

Formerly called ν Fornacis.
Separately observed on the meridian at Cordoba.

No. 38. β 10. Lal. 5276. 7.2
2h 45m 22s — 5° 24′.0.

7.3 and 10.6

1874.8	99°.2	2″.66	Dembowski	4 n
1877.8	101.2	2.83	Cinc.	2–1
1879.7	100.1	2.56	,,	1

The f. and brightest of three stars forming a triangle in the finder.

No. 39. β 877. γ_1 Fornacis. 6.4
2h 45m 25s — 24° 58′.2.

Comes = 13.0

1880.9	144°.4	11″.5	β	4 n
1892.0	145.5	12.0	,,	2

The C. P. D. mag. of this star is 7.4.
h noted a 10.5 mag. star about 47″ distant.

No. 40. h. 3535. γ_2 Fornacis. 5.6
2h 45m 34s — 28° 21′.4.

6.1 and 6.6

1835.9	Double?		*h*	1 n
1877.41	316°.8	2″.03	Melbourne	1
1883–4	Elongated		Cinc.	2
1891	Single		β	1

The Melbourne measure was communicated. It leaves little doubt but that this is a binary system.

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No. 41. h. 3536. η_2 Fornacis. MAG. 5.7
$2^h\ 46^m\ 12^s$ — 36° 15′.5.

Comes = 10.5

1835.8	6.°0	4.″ ±	*h*	1 n
1879.7	9.8	6. ±	*β*	2
1880.0	12.6	6. ±	Pollock	1
1897.7	12.6	4.86	See	1

η_3 Fornacis is about 11′ N.f.

No. 42. λ 21. Ö.A. 1861. 8.3
$2^h\ 47^m\ 14^s$ — 21° 42′.1.

Both = 9.1

1897.6	98.°1	0.″36	See	1 n

No. 43. Cordoba [6]. C.Z. 2h. 1269. 8.5
$2^h\ 47^m\ 15^s$ — 45° 39′.0.

Both = 9.3

1896.8	0.° ±	3.″ ±	Innes	1 n

A neat pair.

No. 44. Harvard 59. Ö.A. 1882. 8.6
$2^h\ 49^m\ 14^s$ — 28° 15′.8.

8.8 and 10.8

1869.9	101.°4	3.″29	Harvard	1 n

A wider and fainter pair, Harvard 60 is S.f.

No. 45. h. 3541. C.Z. 2h. 1358. 8.5
$2^h\ 49^m\ 57^s$ — 60° 20′.2.

8.7 and 10.4

1836.8	150.°4	1.″5 ±	*h*	1 n
1883.0	157.0	2.19	Hargrave	1

No. 46. Innes 148. Cape 1880, 1214. 7.6
$2^h\ 52^m\ 17^s$ — 63° 24′.6.

7.8 and 9.3

1897.1	5.° ±	4.″ ±	Innes	1 n

No. 47. Cordoba [7]. C.Z. 2h. 1413. MAG. 8.0
$2^h\ 52^m\ 41^s$ — 39° 50′.7.

8.5 and 9.0

1896.8	175.° ±	4.″ ±	Innes	1 n

No. 48. Innes 149. Cor. D.M. —23°, 1138. 9.4
$2^h\ 52^m\ 48^s$ — 23° 47′.1.

9.9 and 10.4

1897.0	260.° ±	3.″ ±	Innes	1 n

Cor. D.M. - 23°, 1136, mag. 8.9, is 13 secs. pr.

No. 49. β 741. Lac. 932. 8.2
$2^h\ 52^m\ 50^s$ — 25° 22′.3.

8.9 and 9.1

1879.7	158.°4	0.″57	*β*	4 n
1891.8	165.6	1.26	,,	3

Another star, 8.3 mag., 28″ S.pr., makes, with the above pair, the old pair South 423 or Dunlop 8, which shows no signs of change.

No. 50. Piazzi 2. θ Eridani. 3.1
$2^h\ 54^m\ 28^s$ — 40° 42′.3.

3.3 and 4.8

1835.9	81.°5	8.″71	*h*	2 n
1845.9	81.3	8.66	Jacob	1
1851.8	82.4	8.11	,,	7
1852.9	83.0	7.93	,,	6
1857.9	83.1	8.03	,,	2
1874.0	82.3	8.19	Russell	1
1877.8	84.4	8.54	Cinc.	1
1882.2	85.0	8.44	Tebbutt	1
1890.0	84.3	8.34	Pollock	3
1893.3	85.6	8.44	Scott	4
1897.1	84.5	8.51	See	2

A fine double star with a common p.m. of 0.″085 towards 290°.6.

A slow increase in the angle.

The temporary diminution of the distance during

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1851–1874 is remarkable, and suggests the inevitable disturbing body.

It will be interesting if the phenomenon is repeated.

This pair is erroneously called *h* 3545 by Mr Russell.

Also registered as Dunlop 9.

No. 51. β 11. ρ_2 Eridani. MAG. 5.4
2h 57m 48s — 8° 4′.7.

Comes = 9.6 (variable ?)

1875.6	87°.2	2″.72	Dembowski	5 n
1877.8	85.9	2.45	Cinc.	3–2
1879.9	85.1	2.47	β	3
1886.8	81.8	2.72	L. McC.	2
1891.8	84.8	2.64	Haverford	2

The p.m. is about 0″.01.

The middle of three bright stars.

No. 52. β 1174. Lal. 5683. MAG. 7.5
2h 58m 44s — 11° 21′.9.

Comes = 11.2

1890.82	305°.9	1″.22	β	3 n

P.m. of 0″.178 towards 180°.

No. 53. h. 3549 Cor. D.M.—38°,1007. 9.4
2h 59m 10s — 38° 27′.3.

Comes = 11.2

1836.9	275°.9	4″.5 ±	*h*	2 n
1879.0	222.5	1.94	Hargrave	1
1898.0	280. ±	6. ±	Innes	1

Hargrave's angle is given = 225°.5 in the *Mem. R. A. S.* As explained elsewhere, the official publication is followed; but there seems to be some error in the observation, the pair is almost certainly fixed.

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No. 1. β 527. Lal. 5765. MAG. 8.3
3h 1m 32s — 13° 38′.5.

8.9 and 9.2

1877.8	60°.4	0″.85	β	1 n
1878.0	57.6*	0.76	Cinc.	1
1892.0	66.0	0.83	β	3

Closely N.pr., Σ 356, a 16″ pair.

No. 2. β 528. W.B. 2 h. 1086. 8.3
3h 3m 25s — 3° 58′.4.

Both = 9.1

1878.0	197°.5	1″.01	β	2 n
1886.8	192.5*	0.91	L. McC.	1
1891.7	195.4	1.00	Haverford	1

In the field with Σ 358, a 15″ pair.

No. 3. Σ 357. B.D.—13°, 596. 8.4
3h 3m 30s — 12° 59′.1.

8.8 and 9.6

1833.0	294°.7	7″.88	Σ	3 n
1866.8	295.1	8.04	Dembowski	3
1896.2	295.2	7.96	Aitken	4

No. 4. Cape 3. C. Z. 3 h. 108. 9.2
3h 4m 30s — 42° 53′.8.

9.8 and 10.1

1897.0	250° ±	2″ ±	Innes	1 n

The duplicity of this star was discovered by Mr W. H. Cox at the Transit-Circle.

No. 5. Innes 54. C. Z. 3 h. 123. 8.7
3h 5m 0s — 41° 44′.7.

9.4 and 9.6

1896.8	320° ±	0″.7 ±	Innes	1 n

Closely S.f. Bris. 484, mag. 8.3.

No. 6. Ormond Stone. Cor. D.M. — 23°, 1246. 9.1
3h 5m 50s — 23° 6′.7.

9.7 and 10.0

1875.9	178°.0	3″.77	Cinc.	2–1 n
1886.6	178.5	4.72	L. McC.	2

No. 7. h. 663. 94 Ceti. MAG. 5.0
3h 7m 40s — 1° 34′.2.

Comes = 11.5

1830. ±	255°. ±	6″. ±	h	1 n
1871.0	253.1	5.09	Dembowski	2
1878.7	251.9	5.73	β	2–1
1896.2	249.8	4.60	Aitken	2

Common p.m. of 0″.194 towards 112°.
"Not easy." (β with a 6-inch refractor.)

No. 8. h. 3555. α Fornacis. 3.8
3h 7m 49s — 29° 22′.9.

3.9 and 6.9

1835.9	306°.1	3″. ±	h	1 n
1847.0	309.8	4.09	Jacob	1
1851.1	308.3	3.39	,,	2
1853.0	309.8	3.29	,,	4–3
1856.2	310.0	3.31	,,	4
1877.0	310.9	2.45	Schiaparelli	1
1877.8	316.9	2.56	Cinc.	3
1884.8	321.7	2.33	,,	2
1888.0	320.0	1.53	Sydney	2
1889.0	326.6	1.97	Hall	2
1895.9	320.4	.....	Doberck	5
1897.7	330.2	1.58	See	1

Also known as 12 Eridani.
Common p.m. of 0″.712 towards 25°.2.
A binary and evidently approaching periastron.

No. 9. λ 22. Ö.A. 2118. 7.7
3h 8m 26s — 30° 31′.5.

8.0 and 9.7

1897.7	338°.7	0″.95	See	1 n

Identification somewhat doubtful.

No. 10. Triple. Piazzi 3 h. 19. 5.9
3h 8m 55s — 44° 47′.7.

A = 6.5 B = 7.0 C = 10.1

Innes 55 = A and B

1896.8	185°. ±	0″.8 ±	Innes	2 n
1897.0	190. ± *	1.0 ±	Sellors	1

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h 3556 = A + B and C

1835.8	235°.5	1".5 ±	*h*	1 n
1848.1	237.6	1.8 ±	Jacob	1
1851.1	230.5	2.44	,,	3–2
1856.2	228.4	2.83	,,	3
1872.	230. ±	1.5 ±	Russell	1
1879.0	204.1	2.12	Hargrave	1
1897.0	214.7	2.94	Sellors	3
1897.1	220.3	2.46	See	2

The close pair was found at the Cape in October 1896, and independently detected at Sydney early in 1897. Also seen at Arequipa (see *Harvard Circular*, No. 18, 29th July 1897). In 1856, Jacob remarks:—"A suspicion that A is a close double in a direction nearly South."

Hence it may be assumed that the close pair is stationary, or that the period is about forty years. A very few years will suffice to show which is the case.

Some change shown in the more distant star.

No. 11. β 529. Lal. 6006. MAG. 8.2
3h 9m 8s — 8° 56′.7.

Comes = 12.3

1877.9	220°.0	2".40	β	2 n
1891.9	222.4	3.11	,,	2

No. 12. Sellors 4. C. Z. 3 h 292. 8.5
3h 10m 15s — 47° 34′.1.

9.2 and 9.4

1892.0	248°.7	0".95	Sellors	2 n

Lac. 1024, mag. 7.5, is 40 secs. pr.

No. 13. β 84. W.B. 3 h. 147. 6.0
3h 11m 4s — 6° 17′.3.

6.4 and 7.2

1875.8	10°.3	0".51	Dembowski	5–1 n
1877.8	28.1	.....	Cinc.	2
1879.0	32.7	0.68	β	4
1879.8	30.6	0.74	Cinc.	1
1886.7	27.1	0.76	L. McC.	3
1888.9	21.5	0.65	Haverford	2–1
1890.9	27.3	0.73	β	4
1897.1	21.4	0.87	Aitken	1

The measures are too discordant to allow of any safe inference.

W.B. 3 h. 152, mag. 6.3, is N.f.

No. 14. Alvan Clark 2. 95 Ceti. MAG. 5.7
3h 13m 15s — 1° 17′.7.

5.8 and 8.3

1853.97	.....	0".8 ±	A. Clark	1 n
1854.75	66.9	0.8 ±	Dawes	1
1854.82	73.5	0.7 ±	,,	1
1854.83	75.4	0.7 ±	,,	1
1866.88	350.9	.....	Winlock	1
1866.88	12.9	.....	Searle	1
1866.90	[26.7]	.....	Winlock	1
1867.09	82.6	.....	,,	1
1878.86	Single		β	2
1886.74	,,		L. McC.	2
1888.72	104.4	0.53	β	1
1888.77	121.2	0.37	,,	1
1890.88	Single		,,	2
1891.73	,,		,,	1
1897.83	147.9	0.46	Lowell	2

A rapid binary, of which all the measures found are given. The period may be six or seven years.

Common p.m. of 0."243 towards 106°.

See also:—1893, Burnham, *Astronomy and Astrophysics*, vol. xii. p. 681.

No. 15. Dunlop 12. Lac. 1069. 6.9
3h 13m 35s — 64° 48′.7.

7.0 and 9.5

1835.9	101°.8	18".1	*h*	1 n
1870.9	102.6	19.3	Russell	1
1879.6	102.9	19.5	Hargrave	2

The *comes* is C. G. A. 3595, and it probably shares in the p.m. of the chief star, 0".080 towards 208°.6.

No. 16. β 1177. 1st Munich, 1060. 9.3
3h 13m 47s — 1° 23′.3.

Both = 10.1

1890.8	24°.7	0".38	β	3 n

About 9′ S.f. 95 Ceti = No. 14

No. 17. λ 23. 15 Eridani. 5.1
3h 13m 57s — 22° 52′.6.

5.2 and 7.8

1897.7	289°.9	0".30	See	1 n

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No. 18. h. 3565. Lal. 6160. MAG. 5.7
3h 14m 7s — 18° 55′.3.

5.8 white, and 8.7 greenish

1835.8	110.4	5.77	*h*	2–1 n
1845.9	109.6	5.73	Jacob	1
1853.1	110.4	5.56	,,	2
1876.0	111.6	5.94	Cinc.	1
1893.1	116.3	5.64	Glasenapp	2

No. 19. Jacob [1]. τ_4 Eridani. 3.8 Yellow.
3h 15m 4s — 22° 7′.3.

Comes = 9.6

1858.0	287.0	5.47	Jacob	2 n
1877.9	287.1	4.77	Cinc.	1
1880.0	281.8	5.41	β	1
1897.7	287.8	6.09	See	1

β also measured four other, but more distant faint stars.

The p.m. of the chief star is 0″.041 towards 26°.0.
The combined mag. in the C. P. D. is 5.7.
Howe 4, a minute pair, is closely N.pr.

No. 20. Innes 56. C. Z. 3 h. 426. 8.5
3h 15m 6s — 43° 0′.4.

8.7 and 10.5

1896.8	260.±	2½″.±	Innes	1 n

Bris. 553, mag. 7.5, is N.f.

No. 21. Innes 150. C. Z. 3 h. 460. 8.2
3h 15m 56s — 63° 26′.3.

8.4 and 9.9

1897.1	355.±	3.″±	Innes	1 n

ζ_2 Reticuli, mag. 5·1, is 33′ N.

No. 22. β 531. Lal. 6275. 6.5
3h 18m 25s — 8° 8′.6.

Comes = 12.0

1877.9	60.1	2.″43	β	2 n
1891.7	53.6	2.94	,,	3

Common p.m. of 0″·247 towards 180°.

No. 23. Innes 151. C. Z. 3 h. 513. MAG. 8.2
3h 18m 39s — 41° 40′.6.

8.9 and 9.1

1897.6	160.±	1.″±	Innes	2 n

The preceding star of a group.

No. 24. β 12. Lal. 6312. 6.3
3h 19m 43s — 14° 20′.8.

6.5 white, and 8.5 reddish

1875.4	271.8	2.″35	Dembowski	4 n
1877.8	273.4	2.30	Cinc.	3
1886.8	274.8	2.45	L. McC.	5–4
1888.5	272.6	2.31	Haverford	2

No. 25. h. 3576. Lac. 1100. 6.8
3h 21m 14s — 46° 1′.0.

7.0 yellow, and 8.7 blue

1836.5	341.0	4.″18	*h*	2 n
1879.0	340.4	3.03	Hargrave	1
1895.9	340.7	.....	Doberck	3
1897.1	341.8	3.29	See	2

Separately observed on the meridian at Cordoba. Prof. See's measure is from his λ24, which is identified as C. Z. 3 h. 618, an 8·5 mag. star about 30′ N.f. the above pair. C. Z. 3 h. 618 is single in the 7-inch telescope at the Cape, and it has been presumed that Prof. See really measured *h* 3576.

No. 26. β 1180. Lal. 6417. 8.2
3h 23m 23s — 4° 54′.5.

8.6 and 9.6

1890.82	24.8	0.″44	β	3 n

An 11·5 mag. star at 118°, 7″.

No. 27. Innes 57. C. Z. 3 h. 686. 9.0
3h 24m 0s — 59° 38′.2.

9.3 and 10.4

1896.9	210.±	1.″6±	Innes	2 n

C. G. A. 3804, mag. 8.7, is 12 sec. f.

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No. 28. Innes 58. χ_3 Fornacis. MAG. 6.6
3h 24m 20s — 36° 12′.0.
Comes = 10.5

1896 9	250.° ±	6.″ ±	Innes	2 n

The central star of a group.

No. 29. Σ 407. Lal. 6490. 8.1
3h 25m 13s — 11° 29′.3.
8.4 and 9.6

1833.0	39.°0	2.″33	Σ	3 n
1868.2	45.4	2.57	Dembowski	4
1879.0	48.6	2.28	β	3
1881.0	44.2	2.71	Pritchett	1
1886.6	42.6	2.90	L. McC.	1
1888.1	47.2	2.73	Hall	3

Common p.m. of 0″.176 towards 204°.7.

No. 30. Σ 408. W.B. 3 h. 412. 7.8
3h 25m 40s — 4° 36′.9.
8.5 and 8.7

1832.0	347.°5	1.″37	Σ	3 n
1841.7	342.5	1.62	OΣ	1
1864.0	338.4	1.25 ±	Dembowski	2
1886.7	336.2	1.48	L. McC.	3
1888.1	339.0	1.24	Hall	3
1895.9	333.4	.....	Doberck	3

Some change.
Other measures.

No. 31. λ 26. Lac. 1128. 6.9
3h 28m 8s —24° 57′.3.
Both = 7.7

1897.8	180.° ±	0.″17	See	1 n

No. 32. Cordoba [8]. ε Eridani. 3.7
3h 28m 13s — 9° 47′.8.
Companion = 9.0

1882.0	S.	7″	Cordoba	6 n

The p.m. of the chief star is 0″.997 towards 270°.6.

The companion was carefully looked for on five nights in 1895 and 1896 by the writer, but no star as bright as 9.0 was seen within 5′. The only observations of it are the meridian observations made at Cordoba on six occasions.

No. 33. β 532. D.M.—10°, 696. MAG. 8.6
3h 28m 23s — 10° 23′.0.
Comes = 12.2

1878.3	266.°7	3.″05	β	3 n
1891.9	271.2	3.05	,,	2

Lal. 6585, mag. 8.0, is about 85″ N.pr.

No. 34. λ 27. Ö.A. 2344. 8.5
3h 28m 26s — 19° 35′.7.
9.0 and 9.6

1897.8	351.°1	0.″34	See	1 n

No. 35. β 308. Lal. 6709. 8.3
3h 33m 2s — 7° 58′.2.
8.6 and 9.8

1876.0	332.°9	1.″65	Hall	3 n
1876.8	329.9	1.50	Dembowski	3
1886.7	331.7	1.78	L. McC.	3
1888.0	331.9	1.81	Hall	3

No. 36. β 534. Lal. 6741. 7.2
3h 33m 59s — 8° 50′.0.
Comes = 10.9

1877.9	196.°2	2.″32	β	2 n
1891.9	193.1	2.58	,,	2

No. 37. Dunlop 15. Piazzi 3 h. 126. 6.7
3h 36m 11s — 40° 40′.6.
7.2 and 7.9

1836.0	326.°6	8.″81	*h*	4 n
1847.3	326.9	8.09	Jacob	3
1882.2	327.5	7.96	Tebbutt	1
1897.1	327.1	7.83	See	2

No. 38. Sellors 5. C. Z. 3 h. 1139. 7.2
3h 38m 46s — 48° 33′.3.
Comes = 10.1

1892.0	188.°2	1.″72	Sellors	3 n

No. 38a. Leavenworth. W.B. 3 h. 710. 8.1
3h 39m 28s — 13° 43′.0.
8.3 and 10.1

1886.8	359.°4	1.″18	L. McC.	2 n
1888.9	358.6	1.08	Haverford	2

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No. 39. h. 3589. Lac. 1214. MAG. 6.6
3h 40m 34s — 40° 58′.3.

Comes = 9.9

1837.1	344°.8	6″.58	*h*	1 n
1883.0	349.0	4.64	Hargrave	1
1897.1	348.1	5.18	See	2

A physical system, the p.m. of the chief star being 0″.096 towards 159°.3.

No. 40. β 1003. Ö.A. 2518. 7.8
3h 41m 13s — 28° 10′.8.

Comes = 11.5

1881.8	20°.5	2″.69	β	2 n
1892.0	30.4	2.48	,,	3

No. 41. Triple. Lac. 1237. 6.2
3h 42m 1s — 54° 35′.3.

A = 6.8. B = 7.5. C = 9.2 blue.

A and B = λ 30

1897.1	290°.3	0″.63	See	2 n

A + B and C = *h* 3592

1837.0	11°.3	5″.98	*h*	2 n
1873.0	17.2	5.72	Russell	1
1878.9	17.3	5.13	Melbourne	1
1889.0	11.2	5.12	Pollock	4
1891.1	14.0	5.00	Sellors	2
1894.9	16.8	5.45	Tebbutt	2
1897.0	12.3	5.56	See	3

No. 42. λ 32. Piazzi 3 h. 180. 6.7
3h 44m 4s — 36° 24′.8.

Comes = 13.2

1897.7	44°.0	2″.18	See	1 n

No. 43. β 539. W.B. 3 h. 809. 9.0
3h 44m 12s — 1° 48′.8.

9.2 and 11.1

1877.9	272°.2	2″.79	β	2 n
1878.0	269.8	2.34	Cinc.	2
1891.9	271.6	2.69	β	2

Bradley 531, mag. 7.5, is about 6′ N.f., and β 401 is 59 secs. f.

No. 44. Dunlop 16. f Eridani. MAG. 4.5
3h 44m 54s — 37° 55′.7.

4.9 and 5.6

1836.5	199°.7	8″.55	*h*	2 n
1846.9	200.4	7.17	Jacob	3
1853.1	202.6	7.07	,,	6–5
1877.7	204.1	7.59	Cinc.	1
1889.0	205.3	7.34	Haverford	3
1895.9	205.4	7.41	Doberck	5–3
1897.7	206.7	7.81	See	1

Many other measures.

Called *h* 3597 in the first *Sydney Catalogue*, but erroneously so.

No. 45. β 401. Lal. 7109. 7.9
3h 45m 11s — 1° 49′.6.

Comes = 11.2

1877.2	254°.5	4″.65	Dembowski	3 n
1877.9	255.3*	4.42	Cinc.	1
1878.9	256.0	4.18	,,	2
1891.9	256.0	4.64	β	2

Near β 539. See No. 43.

No. 46. Washburn 66. Lal. 7187. 8.2
3h 47m 45s — 8° 47′.3.

Comes = 12.5

1888.8	31°.2	2″.20	Washburn	5–3 n

Prof. Comstock assigns a p.m. of 0″.16 towards 102° to the chief star.

No. 47. h. 338. 30 Eridani. 5.4
3h 47m 45s — 5° 39′.6.

Comes = 10.2

1827. ±	135°. ±	10″. ±	*h*	1 n
1863.8	136.8	8.28	Winnecke	3–2
1864.4	135.2	8.17	Dembowski	5–4
1878.0	135.3	8.34	β	1

"Large star single" :—β.

Its p.m. is about 0″.04.

Thought to be a new pair when measured by Winnecke.

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No. 48. H. II. 36. *w* Eridani. MAG. 4.8 Orange

3h 49m 16s — 3° 15′.0.

Companion = 7.3 blue

1833.2	347°.3	6″.70	Σ	3 n
1851.1	347.5	6.75	Jacob	2
1889.1	346.9	6.60	Maw	2
1892.8	344.6	6.63	Glasenapp	2

Small common p.m.

Many other measures. Also called Σ 470 and 32 Eridani.

Two wide pairs will be found N.pr.

No. 49. Washburn 67. Lal. 7249. 7.8

3h 49m 51s — 13° 1′.0.

8.3 and 9.0

1887.0	153°.4	2″.97	L. McC.	4 n
1888.3	157.7	3.12	Washburn	3

No. 50. β 541. W.B. 3 h. 923. 8.8

3h 49m 54s — 1° 33′.5.

9.0 and 11.0

1877.9	259°.8	1′.34	β	1 n
1884.8	261.6	1.41	Cinc.	1

The R.A. given by β is in error by about 1m.

No. 51. Harvard. Piazzi 3 h. 206. 5.6

3h 50m 53s — 40° 38′.8.

Noted as double within 30″ at Arequipa.

See *Harvard Circular*, No. 18.

With the 7-inch Cape refractor a 10th mag. star is seen 12″ ± at 180° ±.

Mag. in C.P.D. = 6.7.

No. 52. β 542. Paris 4610. 8.7

3h 51m 20s — 7° 14′.2.

9.1 and 9.9

1877.9	198°.4	1″.65	β	1 n
1886.8	193.1	1.56	L. McC.	2
1892.0	192.9	1.52	β	3

No. 53. Harvard. Lac. 1304. MAG. 6.3

3h 51m 56s — 52° 58′.9.

Comes = 12.5

1897.1	267°.6	22″.8	See	2 n

No. 54. β 543. Lal. 7333. 8.7

3h 52m 25s — 1° 26′.7.

Comes = 11.0

1877.8	32°.0	11″.2	β	1 n
1891.7	28.4	11.2	,,	3

This otherwise insignificant pair has a common p.m. of 0″.283 towards 228°.3.

It might repay the trouble if all near *comites* to p.m. stars were measured.

No. 55. h. 3611. Lac. 1302. 7.7

3h 53m 5s — 40° 12′.3.

8.2 and 8.8

1836.9	139°.2	4″. ±	*h*	1 n
1888.0	141.8	4.15	Pollock	2
1891.0	139.0	3.60	Scott	2
1895.9	143.1	.....	Doberck	2
1897.1	143.4	3.95	See	2

In the C. G. A., where both stars are recorded, the mags. are reversed.

No. 56. Washburn 70. W.B. 3 h. 996. 8.5

3h 53m 11s — 5° 11′.1.

8.9 and 9.8

1888.1	272°.3	3″.42	Washburn	3 n

No. 57. Washburn 71. W.B. 3 h. 1005. 8.7

3h 53m 19s — 9° 11′.8.

Comes = 12.2

1888.4	157°.2	4″.05	Washburn	3–1 n

W.B. 3 h. 1012, mag. 8.1, is S.f.

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No. 58. β 1042. B.D.—3°, 651. MAG. 9.0
$3^h\ 53^m\ 40^s$ — 3° 0′.0.

9.4 and 10.2

1888.9	35°.1	1″.09	β	4 n

Lal. 7372, mag. 7.1, is 55″ N.pr.

No. 59. Σ 489. Pos. Mediæ 401. 8.6
$3^h\ 57^m\ 28^s$ — 7° 17′.5.

9.3 and 9.5

1831.1	195°.1	3″.29	Σ	3 n
1867.1	196.1	2.93	Dembowski	3
1886.9	197.0	3.22	L. McC.	3
1893.0	197.7	3.05	Glasenapp	2

No. 60. β 1004. Lac. 1326. MAG. 6.7
$3^h\ 58^m\ 12^s$ — 34° 45′.6.

7.3 and 7.7

1881.8	154°.1	1″.79	β	2–3 n
1895.1	144.8	1.54	Sellors	3
1897.7	144.2	1.77	See	1

Noted as double at Cordoba.
A 11.3 mag. star 63″ distant.

No. 61. Innes 269. Bris. 646. 7.3
$3^h\ 58^m\ 39^s$ — 54° 41′.1.

Comes = 10.0

1898.0	87°.±	2″.5 ±	Innes	1

Lac. 1342, mag. 7.2, is 48″ N.pr.; and Bris. 644, a coarse pair noted at Cordoba in 1874, is 6′ N.pr.

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No. 1. Washburn 72. B.D.—9°, 806. MAG. 9.0
4h 0m 2s — 9° 1′.1.

9.7 and 9.9

1888.1	33.1	2.03	Washburn	3 n

No. 2. Russell 38. Lac. 1592. 6.4
4h 0m 55s — 85° 33′.6.

6.7 and 7.9, both white

1871.0	236.3	1.58	Russell	2 n
1877.0	246.0	2.04	Melbourne	1
1891.0	244.3	1.75	Sellors	3
1893.0	244.7	1.76	,,	2
1894.1	247.9	1.28	,,	1

Also registered as Russell 47 and Russell 51.
Seen also at the Cape in 1873, and at Cordoba in 1874.

No. 3. Pollock [2]. Lac. 1365. 8.0
4h 1m 5s — 59° 51′.3.

8.5 and 9.2

1891.1	109.0	2.5 ±	Sellors	1 n
1896.1	107.8	1.89	,,	3

Also catalogued as Innes 2.
First seen by Pollock in 1887. See *Astr. Nach.*, No. 3423.
Cape, 1880, No. 1745, mag. 8.7, is 3′ N.pr.

No. 4. Innes 152. C. Z. 4 h. 12. 7.6
4h 1m 13s — 35° 43′.0.

8.1 and 8.6

1897.1	70. ±	0.65 ±	Innes	1 n

The pr. star of an elongated group.

No. 5. Howe. Ö.A. 2823. 8.0
4h 3m 2s — 29° 4′.5.

8.6 and 8.9

1878.1	167.4	1.22	Cinc.	1 n
1884.9	169.1	1.21	,,	1

No. 6. Innes 153. Lac. 1367. MAG. 7.1
4h 4m 26s — 33° 7′.4.

7.7 and 8.0

1897.1	320. ±	0.9 ±	Innes	1 n
1897.7	337.4	0.62	See	1

No. 7. Howe 5. Lal. 7947. 7.5
4h 8m 57s — 28° 47′.8.

8.2 and 8.3, both white

1876.0	33.1*	2.57	Cinc.	4–1 n
1877.4	34.0	2.42	,,	2
1884.9	36.3	2.41	,,	1

No. 8. ℍ. N. 24. A Eridani. 4.9
4h 9m 38s — 10° 30′.3.

Comes = 10.0

1809.0	175.0	.....	ℍ	1 n
1831.7	153.9	6.35	Σ	4
1855.9	151.1	6.36	Dembowski	3
1856.5	149.9	6.46	Morton	4
1868.2	150.9	6.46	Dembowski	4
1878.9	149.4	6.31	Cinc.	2
1888.1	150.1	6.44	Hall	3
1891.4	150.2	6.49	Haverford	2–1

Common p.m. of 0″.164 towards 193°.0.
Other measures.
Also known as Σ 516.
At present the earlier angles seem irreconcilable.

No. 9. ℍ. II. 80. o_2 Eridani. 4.5
4h 10m 40s — 7° 48′.5.

A = 4.5 B = 9.2 C = 10.9

A and B

1888.8	105.5	82.15	β	2 n

B and C = W.B. 4h, 166

1891.78	97.4	2.48	β	4 n
1893.21	93.8	2.18	Comstock	1

[contd.

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Many other measures.

Common p.m. of 4″.055 towards 211°.9, in which the three stars participate, forming one of the most remarkable systems in the heavens.

The period of B and C is 180 years, and although the stars are so faint, the semi-axis major is upwards of 4″.

Full particulars of this important triple will be found in a paper by β in the *Monthly Notices of the R. A. S.*, vol. liii. p. 478.

From Dr Gill's heliometer determinations the parallax of the chief star is 0″.166.

There is an 11.9 mag. star between A and B + C, but it is not connected with the system.

See also:—

1882. Hall, A., "Motion," *Sidereal Messenger*, vol. i. p. 94.

1886. Gore, J. E., "Motion," *M. N. R. A. S.*, vol. xlvi. pp. 291–293.

1893. Burnham, S. W., "Orbit", *M. N. R. A. S.*, vol. liii. pp. 478–482.

1896. Glasenapp, S. von, "Orbit," *Astr. Nachr.*, No. 3357.

1896. Stichtenoth, A., "Orbit," *Astr. Nachr.*, No. 3366.

No. 10. β 548. Lal. 8027. MAG. 7.5
4h 11m 50s — 10° 20′.0.

Comes = 11.6

1877.9	347°.0	6″.24	β	1 n
1879.1	345.3	.....	Cinc.	1
1891.9	345.4	6.10	β	2

No. 11. h. 3641. Lac. 1425. 5.3
4h 13m 29s — 62° 26′.6.

Comes = 10.8

1837.0	289°.6	6″.90	*h*	1 n
1874.0	270.1	8.39	Russell	1
1879.1	269.0	7.82	Hargrave	1
1897.0	267.2	7.69	See	1

Also registered as *h* 3748.

a Reticuli, mag. 3.3, is 17′ S.f., and has a distant faint companion.

No. 12. Innes 270. υ_4 Eridani. MAG. 3.8
4h 14m 7s — 34° 2′.5.

4.2 and 5.2

1898.1	330°. ±	0″.5 ±	Innes	3 n

Also called X Eridani.
The p.m. is very small.
A faint star is N.

No. 13. Gale. Lac. 1430. 6.4
4h 14m 50s — 61° 11′.6.

6.6 and 8.1

1897.3	339°.0	0″.95	Innes	1 n

Also seen at Arequipa in 1891.

No. 14. h. 3642. Lac. 1419. 6.7
4h 15m 17s — 34° 8′.8.

6.9 and 8.9 reddish

1837.9	157°.6	5″.78	*h*	2 n
1848.8	159.4	5.93	Jacob	4
1876.0	160.9	7.13	Cinc.	2
1879.1	157.4	6.39	Hargrave	1
1896.0	159.8	5.71	Doberck	3–2

No. 15. λ 35. C. Z. 4 h. 472. 8.5
4h 15m 27s — 31° 49′.1.

Comes = 14.3

1897.8	126°.4	2″.41	See	1 n

No. 16. λ 36. Lal. 8212. 7.3
4h 16m 26s — 19° 34′.4.

Comes = 13.7

1897.7	347°.0	7″.92	See	1 n

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No. 17. Rumker 3. θ Reticuli. MAG. 6.1
4h 16m 33s — 63° 29′.9.

6.3 and 8.4

1835.8	6.1	6.″20	*h*	2 n
1874.0	6.3	5.20	Russell	1
1877.0	3.8	4.08	Melbourne	1
1897.1	4.0	5.19	See	2

Called *h* 3644 in error in the first *Sydney Catalogue*.

No. 18. Σ 536. Lal. 8222. 7.1
4h 17m 13s — 4° 54′.8.

7.6 and 8.2, both white

1831.0	149.5	1.″75	Σ	2 n
1834.6	155.4	1.81	,,	2
1867.3	154.4	1.70	Dembowski	3
1874.1	160.2	1.40	Seabroke	2–1
1879.0	160.4	1.50	Cinc.	2
1886.5	163.2	1.92	L. McC.	3
1888.1	162.3	1.56	Hall	3
1893.0	164.4	1.66	Haverford	2

Slow increase in angle.
Other measures.

No. 19. β 744. Piazzi 4 h. 68. 6.2
4h 17m 22s — 25° 57′.8.

Both = 7.0

1891.78	306.6	0.″79	β	3 n
1894.10	301.4	0.59	Sellors	2–1
1897.73	312.1	0.52	See	1

This is the chief star of the coarse triple = *h* 3644.

No. 20. Hough 330. Göttingen 1166. 9.0
4h 18m 19s — 0° 20′.9.

9.2 and 11.2

1890.1	19.6	1.″17	Hough	2 n

Lal. 8168, mag. 6.3, about 2 mins. pr., 1′ N., has been registered as a double star = Hough 329, the companion of the 13th mag. being 33″ distant.

No. 21. Innes 271. Lac. 1437. 7.5
4h 18m 32s —43° 1′.5.

7.7 and 9.9

1898.0	150. ±	2.″3 ±	Innes	1 n

No. 22. Triple. Lac. 1435. MAG. 7.2
4h 18m 33s — 41° 27′.1.

A = 7.2 B = 9.5 C = 10.0
A and B + C = *h* 3646

1836.9	135.8	60.″ ±	*h*	1 n
1898.0	140. ±	50. ±	Innes	1

B and C = C. P. D. – 41°, 475 = Innes 272.

1898.0	170. ±	1.″ ±	Innes	1 n

No. 23. Σ 544. W.B. 4 h. 369. 8.2
4h 20m 2s —8° 58′.6.

8.6 and 9.5

1831.7	356.7	2.″14	Σ	3 n
1853.1	353.5	2.33	Jacob	3–2
1867.5	353.8	2.33	Dembowski	3
1881.4	353.0	2.64	Cinc.	2
1886.9	353.3	2:71	L. McC.	1
1888.0	352.5	2.86	Haverford	1

Another star 2′ pr.

No. 24. β 403. Lal. 8347. 7.3
4h 20m 39s — 2° 27′.7.

7.5 and 9.0

1876.1	100.3	2.″00	Dembowski	1 n
1888.4	98.3	1.95	Haverford	3
1893.1	104.2	1.79	Glasenapp	2

The p.m. is insensible.
Other measures.
In β's original catalogue there is an error of 10′ in declination followed by later observers.

No. 25. Σ 547. W.B. 4 h. 383. 9.2
4h 20m 49s — 1° 37′.4.

9.4 and 11.0

1831.4	344.3	4.″25	Σ	3 n
1878.0	9.8	2.31	β	3
1881.8	14.8	2.40	,,	3
1890.8	28.5	2.01	,,	3

Other measures.
Not seen by Dembowski and others from 1865 to 1877.
The change is due to the p.m. of the smaller star = 0″.052 towards 137°.8 :—
A 7.5 mag. star is S.pr.
See :—

1878. Burnham, S.W., *Astr. Nachr.*, No. 2176.
,, Dembowski, E., ,, ,, ,, 2186.
1891. Burnham, S.W., *Observatory*, ,, 171.

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No. 26. Innes 59. Piazzi 4 h. 92. MAG. 6.6
$4^h\ 21^m\ 14^s$ — 34° 58′.9.

A = 6.6 B = 9.5 C = 10.0

A and B + C

1896.8	210.° ±	60.″ ±	Innes	1 n
1897.7	197.6	42.63	See	1

B and C

1896.9	267.° ±	3.″ ±	Innes	2 n
1897.7	280.6	3.67	See	1

The small pair is = C. P. D. − 35°, 482, mag. 10.4.

No. 27. Rumker 4. Lac. 1475. 6.5
$4^h\ 22^m\ 15^s$ — 57° 17′.8.

7.0 and 7.7

1834.9	228.° 5	5.″ ±	*h*	1 n
1836.9	231.8	7.10	„	1
1851.1	231.5	6.55	Jacob	1
1873.9	233.1	6.92	Russell	1
1882.2	236.2	6.36	Tebbutt	1
1895.9	237.3	6.65	Doberck	2
1897.0	236.0	5.43	See	2

Estimates of the magnitude of the chief star vary from 6.2 to 8.2.

Separately observed on the meridian at the Cape and other observatories.

No. 28. β 311. Lac. 1451. 6.2
$4^h\ 22^m\ 45^s$ — 24° 18′.3.

6.7 and 7.2

1875.9	148.°4*	″.....	Cinc.	1 n
1877.6	147.7	0.89	„	2–1
1891.7	147.5	0.98	Haverford	2
1897.7	153.2*	0.70	See	1

No. 29. Sellors 6. Lac. 1477. 6.9
$4^h\ 23^m\ 5^s$ — 53° 20′.4.

7.1 and 9.2

1892.1	98.°4	0.″81	Sellors	2 n
1895.1	93.1	0.76	„	3

No. 30. h. 3650. Lac. 1464. MAG. 6.8
$4^h\ 23^m\ 15^s$ — 40° 45′.3.

6.9 and 9.3

'1836.9	184.°1	4.″95	*h*	2 n
1847.5	183.1	3.33	Jacob	2
1879.1	182.0	3.20	Hargrave	1
1896.0	180.5	.....	Doberck	4
1897.1	181.3	3.45	See	2

No. 31. β 184. Lal. 8474. 6.7
$4^h\ 23^m\ 37^s$ — 21° 43′.5.

7.1 and 8.1

1873.9	270.°5	1.″2 ±	β	1 n
1877.5	262.5	1.09	Cinc.	2
1889.0	261.4	1.12	Haverford	3–2
1891.7	259.2	1.09	„	1
1895.9	259.8	.....	Doberck	3
1897.8	240.4	1.30	See	1

No. 32. Innes 154. Lac. 1503. 7.5
$4^h\ 27^m\ 37^s$ — 35° 59′.3.

8.0 and 8.5

1897.1	307.° ±	0.″6 ±	Innes	2 n
1898.1	310. ±	0.6 ±	„	2

Piazzi 4h. 118, mag. 6.4, is N.pr., and β 746 is closely S.f.

No. 33. β 746. C. Z. 4 h. 919. 8.0
$4^h\ 27^m\ 57^s$ — 36° 7′.2.

8.4 and 9.4

1879.8	30.° ±	1.″2 ±	β	1 n
1895.1	11.9	1.05	Sellors	3

The S.f. of 3 stars.

See also No. 32.

No. 34. Σ 564. B.D.—12°, 924. 9.4
$4^h\ 28^m\ 33^s$ — 12° 22′.1.

10.1 and 10.2

1831.7	346.°8	3.″44	Σ	3 n
1867.7	343.4	3.38	Dembowski	3
1879.4	344.0	3.48	Cinc.	2

Combined mag. at Cinc. = 6.8.

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No. 35. β 881. 46 Eridani. MAG. 5.6
4h 29m 2s — 6° 56′.9.

Comes = 10.2

1879.0	57.°0	1.″47	β	4 n
1879.4	52.2	1.33	Cinc.	2–1
1891.8	52.7	1.29	β	3

The p.m. is only about 0″.008.

No. 36. β 747. Lac. 1518. 7.5
4h 29m 32s — 38° 29′.6.

7.7 and 9.7

1879.8	240.° ±	2.″5 ±	β	1 n
1894.1	218.4	2.25	Sellors	2

First seen at Cordoba in 1876.

No. 37. β 185. Lal. 8745. 8.3
4h 32m 18s — 15° 7′.6.

8.5 and 10.5

1875.8	235.°4	3.″00	Dembowski	4–3 n
1877.6	235.3	2.75	Cinc.	2

About 40′ S.f., 53 Eridani, mag. 3.9.
A star, mag. 9.2, is closely N.f.

No. 38. β 882. B.D.—11°, 918. 9.4
4h 33m 10s — 11° 20′.9.

9.8 and 10.8

1880.1	231.°6	2.″04	β	1 n
1891.9	226.4	2.25	,,	3

An 8.3 mag. star 14 secs. f. 1′ S.

No. 39. h. 3672. C. Z. 4 h. 1142. 8.3
4h 34m 59s — 35° 29′.9.

8.7 and 9.7

1836.9	289.°6	3.″5 ±	*h*	2 n

Both stars observed on the meridian at Cordoba in 1880. Change doubtful.

No. 40. β 1236. Lal. 8833. MAG. 7.3
4h 35m 18s — 21° 26′.6.

7.4 and 10.4

1891.8	118.°3	1.″42	β	3 n

An 8.9 mag. star = Ö.A. 3266 is 40″ N.pr.

No. 41. Howe 6. Ö.A. 3270. 9.0
4h 35m 25s — 20° 5′.7.

9.4 and 10.4

1877.1	98.°8	3.″46	Cinc.	1 n
1881.7	95.9	3.20	,,	1
1886.7	96.1	3.06	L. McC.	1

Near 54 Eridani, mag. 4.5, which was considered double by Ormond Stone and Dembowski, but found to be single by β.

No. 42. Harvard. α Cæli. 4.5
4h 37m 20s — 42° 3′.2.

Noted as double within 30″ at Arequipa.
From *Harvard Circular*, No. 18.
The p.m. of the chief star is about 0″.2.

No. 43. Innes 60. Cape 1880, 2025. 9.0
4h 38m 6s — 45° 53′.8.

9.7 and 9.8

1896.9	95.° ±	2.″ ±	Innes	2 n

Mag. in C.P.D. = 8.3.

No. 44. h. 3683. Lac. 1583. 6.6
4h 38m 39s — 59° 8′.5.

7.2 and 7.5

1835.5	81.°1	3.″ ±	*h*	2 n
1836.4	81.2	3.82	,,	2
1879.1	79.9	3.39	Sydney	2
1891.0	77.0	1.88	Sellors	2
1897.1	85.1*	0.92	See	3
1897.1	79.5*	1. ±	Cogshall	2
1898.0	80. ±	1.2 ±	Innes	2

Separately observed at Cordoba in 1874 on the meridian. [contd.

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Some decrease in the distance with a nearly stationary angle.

Prof. See considers that this pair is a binary in a period of forty-four years, [see *M. N. R. A. S.*, vol. lvii. pp. 398–401], a conclusion assailed at the time and now quite untenable in view of the measure of 1891, which was omitted by Prof. See, and the estimates of 1898, which placed the smaller star in the N.f. quadrant.

No. 45. H. III. 99. 55 Eridani. MAG. 6.0
4h 38m 47s — 8° 59′.0.

6.5 and 7.1

1783.1	314°.2	″.....	H	1 n
1831.2	318.3	9.13	Σ	4
1845.1	316.7	9.06	Philpott	4
1851.1	316.3	9.17	Jacob	2
1859.9	317.1	9.02	Morton	2
1865.8	316.1	9.00	Dembowski	3
1883.0	316.2*	9.41	Cinc.	1
1893.0	316.4	8.89	Glasenapp	2

Probably stationary. Common p.m. of 0″.024 towards 205°.2.

Also known as Σ 590.

Many other measures.

No. 46. Cordoba [9]. Lac. 1574. 7.4
4h 39m 4s — 48° 0′.8.

7.5 and 10.0

1896.1	233°.7	″3.41.	Sellors	3 n
1897.1	226.3	3.86	See	1

From meridian observations at Cordoba about 1880, this pair seems unchanged.

No. 47. β 186. Lal. 8986. 8.0
4h 41m 8s — 7° 10′.0.

8.2 and 10.0

1875.8	174°.1	″2.00	Dembowski	3 n
1877.9	175.3	1.71	Cinc.	1
1879.1	178.5	1.33	,,	1
1886.6	177.5	1.79	L. McC.	2
1888.5	176.1	1.76	Haverford	2

No. 48. β 312. Lal. 9065. MAG. 7.8
4h 43m 27s — 20° 59′.4.

8.0 and 9.5

1868.1	343°.8	″3.13	Harvard	1 n
1876.0	344.8	3.24	Cinc.	3
1877.5	344.6	3.24	,,	2
1888.1	345.8	3.26	Hall	3

Very slow change.

The date of the Harvard measure might be 1870.1, both being given in the *Harvard Annals*, vol. xiii.

β's by priority of publication.

λ 39, a very faint pair 2″.6 apart, is near this position.

No. 49. h. 3696. C.P.D.—56°, 732. 8.4
4h 45m 58s — 56° 10′.9.

8.8 and 9.5

1834.9	266°.9	″1.8 ±	*h*	2 n
1873.1	278.7	3.62	Russell	1
1895.1	287.4	3.59	Sellors	3

Some change.

No. 50. Cape 4. Lac. 1638. 7.8
4h 46m 8s — 61° 39′.0.

7.5 and 9.2

1891.1	36°.5	″2.64	Sellors	1 n
1894.1	37.1	2.82	,,	2

Noted as a double at the Cape in 1876, and separately observed on the meridian at Cordoba in 1879.

No. 51. Triple. Lac. 1627. 7.5
4h 46m 9s — 50° 3′.5.

A = 8.3 B = 8.3 C = 10.3

A and B = λ 40

1897.1	284°.8	″0.43	See	1 n

A + B and G = Cordoba [10]

1879.0	259°.0	″4.70	C. G. A.	3 n
1897.1	257.1	5.80	See	2

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No. 52. Cordoba [11]. C. Z. 4 h. 1573. MAG. 8.0
$4^h\ 46^m\ 42^s$ — 39° 21′.2.

8.5 and 9.2

1881	N.f.	3.″	C. G. A.	3 n

No. 53. h. 3697. Lac. 1626. 6.0
$4^h\ 47^m\ 1^s$ — 41° 29′.6.

Comes = 8.6

1835.8	284.°6	10.″ ±	*h*	1 n
1881.3	281.6	12.2	Hargrave	1
1897.1	280.9	14.9	See	3

Well seen on Cape photo plates, and apparently not much changed in sixty years.

No. 54. h. 3699. C. Z. 4 h. 1613. 7.7
$4^h\ 47^m\ 44^s$ — 45° 50′.3.

Comes = 12.3

1835.0	142.°5	5.″ ±	*h*	1 n

No. 55. β 316. Lal. 9181. 8.0
$4^h\ 47^m\ 51^s$ — 5° 27′.0.

8.7 and 8.8

1876.1	178.°4	0.″99	Hall	2 n
1878.5	178.5	1.11	Cinc.	2–1
1888.1	178.6	1.01	Hall	3
1888.7	179.2	1.14	Haverford	3

N.pr. ω Eridani, mag. 4.2.

No. 56. Innes 273. C. Z. 4 h. 1630. 9.0
$4^h\ 48^m\ 3^s$ — 45° 5′.7.

9.6 and 9.9

1898.3	350.° ±	1.″ ±	Innes	1 n

C. Z. 4 h. 1563, mag. 8.5 = *h* 3694, a wide pair, is S.pr.

No. 57. β 748. B.D.—7°, 920. 9.5
$4^h\ 48^m\ 16^s$ — 7° 51′.2.

10.2 and 10.3

1879.7	131.°4	1.″03	β	2 n
1891.8	131.1	1.25	,,	2

The pr. of a small triangle of stars in the field :—β.

No. 58. Dunlop 18. ι Pictoris. MAG. 5.6
$4^h\ 48^m\ 42^s$ — 53° 37′.9.

6.0 and 6.9, both yellow

1835.0	57.°9	12.″4	*h*	2 n
1878.5	58.0	12.1	Melbourne	2
1895.9	58.4	12.1	Doberck	2

Fixed.

Called *h* 3702 in error in the first *Sydney Catalogue*.

No. 59. λ 42. Lac. 1651. 6.9
$4^h\ 49^m\ 2^s$ — 51° 53′.6.

7.6 and 7.7

1897.1	117.°2	0.″48	See	1 n

No. 60. Σ 614. W.B. 4 h. 1045. 8.0
$4^h\ 49^m\ 58^s$ — 0° 42′.5.

8.6 and 9.0

1832.1	68.°4	4.″15	Σ.	5 n
1867.2	69.1	4.21	Dembowski	3
1875.9	69.2	2.5 ±	Cinc.	1

No. 61. h. 3707. C.P.D.—59°, 393. 9.2
$4^h\ 51^m\ 29^s$ — 59° 55′.2.

9.4 and 11.0

1835.0	265.°6	3.″ ±	*h*	1 n

Attached to the nebula *h* 2678.

No. 62. h. 3721. C.G.A. 5721 + 20. 7.9
$4^h\ 53^m\ 19^s$ — 80° 48′.7.

8.3 and 9.3

1836.1	219.°4	2.″5 ±	*h*	1 n
1879.1	221.6	2.55	Hargrave	1

The R.A. in the first *Sydney Catalogue* is erroneous.

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No. 63. β 314. Lal. 9420. MAG. 5.4
4h 54m 33s — 16° 31′.9.

5.8 and 6.8

1876.7	324°.9*	0″.43	Dembowski	4–3 n
1879.4	333.3	0.5 ±	Cinc.	2
1889.1	326.9	1.05	β	3

Common p.m. of 0″.3 towards 0°.
At 54″ there is an 8.2 mag. star.

No. 64. Σ 631. Lal. 9460. 7.3
4h 56m 4s — 13° 39′.1.

7.5 and 9.3

1831.7	104°.8	5″.41	Σ	3 n
1867.9	105.6	5.48	Dembowski	4
1878.0	104.1	5.79	Cinc.	3

No. 65. h. 3715. Lac. 1698. 7.1
4h 56m 52s — 49° 36′.4.

7.3 and 8.9

1835.9	110°.7	11″.±	h	2 n
1881.2	109.9	8.97	Hargrave	2
1897.0	113.9	9.61	See	3

The *comes* has been separately observed on the meridian at the Cape and Cordoba

No. 66. λ 44. Ö.A. 3581. MAG. 7.5
4h 57m 7s — 23° 51′.4.

7.7 and 10.0

1897.8	333°.8	1″.93	See	1 n

No. 67. Σ 636. Lal. 9528. 7.0
4h 58m 15s — 8° 48′.3.

7.2 and 8.8

1830.8	100°.4	3″.74	Σ	4 n
1867.3	103.5	3.54	Dembowski	3
1886.7	100.1	3.93	L. McC.	1

As with all stars of this class there are many other measures.

No. 68. β 884. Lal. 9534. 8.3
4h 58m 19s — 12° 34′.8.

9.0 and 9.1

1879.1	19°.0	0″.54	β	2–1 n
1892.0	20.7	0.54	,,	3

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No. 1. Innes 274. C. Z. 4 h. 2075. MAG. 8.0
5h 0m 20s — 50° 55′.8.

Comes = 9.5

1898.3	270°. ±	3″. ±	Innes	1 n

No. 2. Cordoba [12]. C. Z. 5 h. 22. 8.5
5h 0m 39s — 40° 44′.5.

9.0 and 9.5

1880.9	S.pr.	3″	C. G. A.	3 n

Followed by two stars of 8.9 and 8.4 mag.

No. 3. Jacob [2]. γ Cæli. 4.6
5h 0m 48s — 35° 37′.2.

4.7 and 9.6

1847.1	311°.8	2″.92	Jacob	1 n
1851.0	315.5	3.15	,,	2
1852.8	315.7	2.84	,,	5
1854.2	315.6	2.66	,,	3
1857.1	315.8	2.90	,,	11–10
1882.2	318.3	2.23	Russell	1
1891.1	311.1	3.12	Sellors	2
1894.1	307.7	2.34	,,	1
1897.1	313.4	3.17	See	2

Common p.m. of 0″.123 towards 125°.7.
The mag. in the C. P. D. is 6.0.
This star is also indexed as Russell 56 and β 750.

No. 4. λ 45. Lac. 1730. 8.0
5h 1m 55s — 56° 26′.5.

8.7 and 8.8

1897.1	114°.1	0″.39	See	2 n

h 3724 = C.Z. 5 h. 16, two 9.3 mag. stars 3″ apart, is about 35′ N.pr.

No. 5. Hargrave 2. Lac. 1788. 6.8
5h 3m 46s — 74° 28′.8.

Both = 7.6

1883.1	167°.3	0″.75	Hargrave	1 n
1894.1	170.8	0.82	Sellors	1

No. 6. h. 3728. Lac. 1737. MAG. 7.1
5h 5m 17s — 41° 21′.0.

Comes = 9.5

1836.9	263°.5	14″. ±	*h*	1 n
1853.1	260.5	9.8	Jacob	2
1879.1	259.5	10.3	Hargrave	1
1881.2	258.5	8.8	,,	1
1897.1	261.1	10.1	See	4

The p.m. of the chief star is 0″.35 towards 335°.4.
This pair is well shown on Cape photo plates.
The date of Hargrave's first observation is misprinted in the *Mem. R. A. S.*

No. 7. λ 47. Lal. 9765. 7.6
5h 5m 30s — 22° 37′.0.

Comes = 13.4

1897.8	39°.3	3″.52	See	2 n

No. 8. β 885. Lal. 9758. 7.8
5h 5m 54s — 1° 53′.3.

8.3 and 8.8

1880.8	196°.1*	0″.71	β	3 n
1888.9	190.7	0.65	Haverford	2
1892.1	186.5	0.72	,,	1

No. 9. h. 3727. C.P.D.—19°, 760. 9.8
5h 6m 6s — 19° 1′.0.

10.2 and 11.2

1835	32°.3	2″. ±	*h*	1 n

No. 10. β 1006. B.D.—2°, 1169. 9.2
5h 7m 17s — 2° 18′.9.

9.4 and 10.9

1882.0	201°.7	0″.78	β	2 n
1891.9	203.5	0.66	,,	2

B.D. – 2°, 1170, mag. 9.5, is 52″ distant.

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No. 11. H. III. 67. **ι Leporis.** MAG. 4.7
5h 7m 38s — 11° 59′.3.

Comes = 11.0

1832.3	337°.6	12″.8	Σ	6 n
1856.6	336.6	13.1	Morton	2
1867.7	336.2	12.6	Dembowski	4
1880.4	337.8	12.4	β	3
1885.1	336.6	13.3	Cinc.	1

The p.m. is very small.
Also known as Σ 655.

No. 12. Σ 661. **κ Leporis.** 4.4
5h 8m 37s — 13° 3′.6.

4.5 yellow, and 7.2 white

1832.2	358°.7	3″.05	Σ	6 n
1856.9	356.4	2.76	Dembowski	1
1857.9	360.0	3.25	Morton	1
1878.8	358.5	2.51	Cinc.	2
1880.4	360.7	2.67	β	3
1886.8	358.0	2.67	L. McC.	3

Common p.m. of 0″.035 towards 256°.9.
Other measures.

No. 13. χ 48. **C.P.D.—28°, 801.** 9.1
5h 8m 53s — 28° 34′.9.

9.3 and 11.2

1897.8	2°.1	2″.32	See	1 n

No. 14. Rigel. **β Orionis.** 0.3
5h 9m 44s — 8° 19′.0.

Comes = Greenwich 1880, 864, mag. 8.0
H. II. 33

1831.5	199°.8	9″.14	Σ	3 n
1849.2	199.8	9.66	Philpott	1
1865.3	201.1	9.47	Dembowski	5
1887.2	202.0	9.61	Tarrant	2
1890.2	201.4	9.30	Maw	2
1893.1	202.6	9.46	Glasenapp	2

Many other measures.
The p.m. is very small.
Also recorded as Σ 668.

A more distant star noted by Mitchel has been measured by β.

The *comes* has been measured as a close double = β 555.

Both = 8.7 mag.

1878.14	172°.8	0″.35	β	3-2 n
1878.80	54.5	0.25	Russell	2-1
1879.76	158.7	0.42	Cinc.	1
1880-82	Elongated?		β	—
1889-91	Single		,,	6

Mr Russell's angle is the mean of two estimations: the duplicity was considered certain.

Also seen by Mr W. H. Sadler.

The duplicity was also seen by Mr W. J. Macdonnel of Port Macquarie, N.S.W., with a 6-inch Grubb refractor.*

See :—

Burnham, S.W., *M. N. R. A. S.*, vol. xxxviii. pp. 476-8.

No. 15. h. 3735. **Lac. 1759.** MAG. 7.7
5h 9m 47s — 32° 1′.2.

Comes = 8.1

1836.4	150°.8	7″.59	h	2 n
1876.8	153.2	6.77	Cinc.	1
1893.0	152.3	7.04	Scott	1
1895.9	152.8	7.09	Doberck	3

Lac. 1762, mag. 7.3, is 10′ S.

No. 16. H. I. 54. **W.B. 5 h. 165.** 7.2 **Yellow**
5h 9m 49s — 7° 11′.5.

Comes = 9.0

1802.7	311°.5	.....	H	1 n
1830.8	312.7	4.19	Σ	3
1866.4	313.0	3.99	Dembowski	3
1878.1	312.5	4.04	Cinc.	2

Also registered as Σ 667.

No. 17. h. 3739. **Bris. 902.** 8.0
5h 10m 47s — 47° 59′.5.

8.7 and 8.9

1837.9	278°.6	2″.±	h	1 n
1873.1	283.9*	3.34	Russell	1
1896.0	285.2*	.....	Doberck	3

Separately observed on the meridian at Cordoba.

* Privately communicated.

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No. 18. β 318. Lal. 9873. MAG. 8.5
5h 11m 15s — 3° 35′.7.

9.2 and 9.4

1876.2	227°.2	0″.66	Dembowski	3–2 n
1878.6	228.2	0.72 ±	Cinc.	2
1883.1	226.2	0.55 ±	Schiaparelli	1
1886.1	229.8	0.59	L. McC.	1

Common p.m. of 0″.114 towards 180°.

No. 19. Howe. C. Z. 5 h. 381. 8.3
5h 11m 40s — 29° 37′.5.

8.8 and 9.3

1877.1	231°.6	2″.49	Cinc.	2 n

No. 20. h. 3743. C. Z. 5 h. 408. 8.5
5h 11m 48s — 60° 6′.1.

8.9 and 9.9

1836.0	120°.9	3″.5 ±	*h*	2 n
1880.1	129.0	4.42	Hargrave	1

No. 21. h. 3746. Lac. 1831. 7.8
5h 11m 51s — 72° 10′.9.

8.4 and 8.8

1834.9	262°.2	3″.±	*h*	1 n
1873.0	263.5	4.88	Russell	1

Separately observed on the meridian at Cordoba. Fixed.

No. 22. Cordoba [13]. Ö. A. 3846. 8.8
5h 14m 2s — 27° 35′.6.

9.3 and 9.8

1880.9	N.pr.	2″.±	C. G. A.	4 n

No. 23. Innes 61. Lac. 1805. 7.8
5h 15m 14s — 41° 8′.9.

8.3 and 9.0

1897.1	95°.5	0″.64	See	2 n

Found on 24th Nov. 1896.

No. 24. β 189. Lal. 10,023. MAG. 6.7
5h 15m 32s — 5° 28′.1.

Comes = 10.9

1875.9	283°.6	4″.27	Dembowski	3 n
1891.9	286.5	4.09	β	3

No. 25. β 190. W. B. 5 h. 300. 8.0
5h 15m 36s — 8° 7′.8.

8.6 and 9.0

1876.1	355°.3	0″.71	Dembowski	4–2 n
1878.0	1.1	0.5 ±	Cinc.	1
1879.9	3.8	0.53	β	4
1881.2	4.9	0.57	,,	2
1891.0	358.5	0.54	,,	3

A 9.0 mag. star, W.B. 5 h. 301, 35″ N., constitutes with β 190 the old pair ℍ IV. 87 = Σ 692.

No. 26. h. 3750. Lal. 10,063. 4.8
5h 16m 11s — 21° 20′.4.

Comes = 9.5

1835.9	295°.3	3″.±	*h*	1 n
1877.6	278.1	4.01	Cinc.	4
1879.1	283.3	4.26	β	1
1879.4	280.4	3.59	Cinc.	2
1896.9	277.2	3.15	Scott	2

No. 27. h. 3752. Piazzi 5 h. 70. 5.2
5h 17m 40s — 24° 52′.2.

5.4 yellow, and 7.4 blue

1837.4	110°.3	3″.33	*h*	2 n
1851.1	107.6	2.98	Jacob	2
1856.1	110.0	2.86	Secchi	1
1876.1	104.5	3.48	Cinc.	3
1877.0	104.7	3.55	,,	1
1878.7	103.4	2.88	,,	3–1
1889.0	106.6	3.30	Tarrant	2
1892.9	104.0	3.30	Haverford	2
1896.0	107.5	.....	Doberck	3
1897.8	102.1	3.31	See	1

Other measures.
C. Z. 5 h. 599, mag. 9.0, is 59″ S.f.

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MAG.

No. 28. Washburn 73. Ö.A. 3901. 8.5
5h 18m 13s — 17° 22′.2.

8.7 and 10.2

1888.2	48°.9	2″.42	Washburn	3-2 n

No. 29. H. II. 102. Lal. 10,125. 5.8
5h 18m 31s — 8° 30′.6.

6.0 and 7.9

1783.7	142°.4	.....	H	1 n
1830.5	146.0	5.93	Σ	3
1867.8	142.8	5.97	Dembowski	4
1879.7	144.0	5.75	Cinc.	1
1893.1	144.0	5.55	Glasenapp	2
1896.0	140.5	5.95	Doberck	3-2

Also known as Σ 701.

No. 30. C.A.F. Peters. Bradley 757. 7.2
5h 18m 46s — 0° 57′.6.

7.9 and 8.0

1863.2	170°.7	1″.63	OΣ	1 n
1863.9	173.6	1. ±	Winnecke	1
1866.1	171.0	1.43	Dembowski	5-4
1872.2	167.3	1.67	OΣ	1
1876.0	171.2	2.14	Cinc.	4-3
1886.0	169.0*	1.95	L. McC.	1

Small common p.m.

Separately observed on the meridian at the Radcliffe Observatory.

Discovered independently by Winnecke in 1863.

No. 31. Ormond Stone. Lal. 10,131. 8.0
5h 18m 51s — 10° 30′.6.

Both = 8.8

1878.0	121°.2	1″.10	Cinc.	1 n
1888.6	119.5	1.10	Haverford	2
1892.1	123.6	1.12	,,	2
1893.0	126.8	1.15	,,	2

MAG.

No. 32. Dawes 5. η Orionis. 3.5
5h 19m 27s — 2° 29′.3.

3.7 and 4.9

1848.2	86°.6	0″.94	Dawes	9-7 n
1853.1	85.4	1.07	Jacob	5-3
1870.3	84.4	0.99	OΣ	8
1874.6	84.6	1.00	Dembowski	4-3
1877.9	82.8	0.97	Cinc.	2
1878.0	82.5	1.02	Schiaparelli	4
1883.6	86.2	1.13	Engelmann	7
1888.2	87.5	1.13	Hall	3

Change very doubtful.

The p.m. is small.

No. 33. β 556. Lal. 10,159. 8.0
5h 19m 39s — 2° 35′.3.

Comes = 11.3

1878.2	238°.2	0″.79	β	1 n
1879.1	247.2	0.74	,,	1
1891.8	239.2	0.89	,,	3

Near η Orionis.

No. 34. Innes 275. C. Z. 5 h. 684. 8.2
5h 19m 52s — 36° 46′.2.

8.7 and 9.2

1898.1	10°.±	1″.1	Innes	1 n

No. 35. β 319. Ö.A. 3957. 7.5
5h 22m 7s — 20° 48′.1.

Comes = 11.3

1876.1	231°.3	3″.98	Hall	3 n
1876.8	229.4	3.85	Howe	1
1879.1	226.6	3.72	β	1
1891.1	229.8	4.29	Hall	2

Other measures.

β Leporis, mag. 3.0, is f, a little S.

No. 36. λ 53. Lal. 10,310. 8.3
5h 23m 20s — 20° 59′.9.

Both = 9.1

1897.8	15°.0	0″.30	See	1 n

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No. 37. β 320. β Leporis. MAG. 3.0
5h 23m 57s — 20° 50′.3.

Comes = 9.6

1876.4	284°.5	2″.83	Dembowski	4–3 n
1877.3	283.1	2.80	Cinc.	4
1878.1	283.6	2.64	Russell	5
1878.4	286.7	2.62	β	10
1879.2	285.0	2.88	Schiaparelli	8
1880.4	288.3	2.77	Pritchett	3
1881.0	284.0	2.65	β	2
1882.7	287.0	3.03	Schiaparelli	8
1891.1	282.1	2.89	Hall	2
1897.8	288.5	3.05	See	2

Probably fixed, with a common p.m. of 0″.082 towards 194°.9.

C. P. D. mag. = 4.1.

Mr Russell's estimates of the magnitude of the chief star vary from 3½ to 9, and of the *comes* from 9 to 13, perhaps due to misprints.

See:—

1882. Hall, A., "Measures," *Astr. Nachr.*, Nos. 2295 and 2430.

No. 38. Dawes 6. Lal. 10,308. 6.8
5h 23m 58s — 3° 23′.3.

7.4 and 7.7, both white

1854.1	80°.3	0″.82	Dawes	2 n
1866.9	79.4	0.6 ±	Harvard	3
1875.8	84.4	0.69	Dembowski	4–3
1878.0	87.2	0.82	Cinc.	1
1882.1	83.6	0.68	,,	1

No. 39. Σ 725.. 31 Orionis. 4.9
5h 24m 39s — 1° 10′.2.

Comes = 11.0

1829.4	87°.5	12″.7	Σ	3 n
1868.0	87.8	12.6	Dembowski	4
1879.1	88.4	12.7	Cinc.	2–1
1881.7	85.9	12.7	,,	1

Probable common p.m. of 0″.03 toward 220°.

The chief star is orange-coloured, and has been considered variable.

No. 40. h. 3768. C.P.D.—66°, 414. MAG. 9.0
5h 26m 5s —66° 40′.6.

9.6 and 10.0

1835.5	31°.8	1″.7 ±	*h*	2 n

Involved in a thick nebulous mist like dust:—*h*.

The nebula is *h* 2858.

Seen in 1897.3. The stars form the nuclei of an elongated nebula.

See also No. 48.

No. 41. Innes 276. Lac. 1920. 6.4
5h 27m 31s — 68° 42′.1.

7.0 and 7.3

1898.0	210°. ±	0″.5 ±	Innes	1 n

The p.m. is about 0″.08 towards 180°.

No. 42. Harvard 73. Lal. 10,437. 5.2
5h 27m 38s — 1° 39′.8.

Comes = 9.5

1872.1	357°.1	1″.53	Harvard	1 n
1889.1	358.2	2.20	β	3

Also registered as β 1048.

No. 43. Innes 62. C. Z. 5 h. 972. 8.0
5h 27m 48s — 47° 16′.5.

8.5 and 9.2

1896.9	175°. ±	0″.9 ±	Innes	2 n

This pair is in the small group, of which Lac. 1888, mag. 5.6, is the brightest star.

The pair is 24 secs. f. 8′ S.

Lac. 1888 has a distant companion.

No. 44. β 1049. Schj. 1825. 8.3
5h 28m 2s — 1° 47′.6.

8.7 and 9.7

1888.9	296°.1	0″.76	β	4 n

This and the following pair (Σ 734) compose the old pair Ḫ V. 119, 243°, 30″.

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No. 45. Σ 734. W.B. 5 h. 631. MAG. 7.5
5h 28m 4s — 1° 47′.4.

7.7 and 9.2

1832.9	356°.4	1″.78	Σ	5 n
1867.8	353.8	1.65	Dembowski	3
1888.9	355.2	1.61	β	4
1892.9	354.2	1.64	Haverford	2

See also the preceding pair.
Other measures.

No. 46. Dunlop 22. Lac. 1889. 7.2
5h 28m 4s — 42° 22′.5.

Comes = 8.0

1835.0	171°.8	8″.46	*h*	2 n
1846.8	170.2	7.45	Jacob	1
1880.1	169.8	6.48	Hargrave	1
1897.1	169.2	7.47	See	4–3

Separately observed on the meridian at Cordoba.

No. 47. h. 3766. α Leporis. 2.7
5h 28m 19s — 17° 53′.6.

Comes = 10.7

1835	154°.8	25″.±	*h*	1 n
1878	154.8	36.0	β	1
1884	156.5	35.4	Cinc.	1

The p.m. is small.

No. 48. Hargrave. C.Z. 5 h. 1065. 8.0
5h 29m 12s — 66° 41′.4.

Both = 8.8

1883.2	16.9	2.30	Hargrave	1 n
1895.1	21.2	1.58	Sellors	3

The first measure quoted was originally set against *h* 3768 (a pair which is about 3m pr.).

No. 49. h. 3770. Ö.A. 4067. 7.6
5h 29m 23s — 24° 24′.1.

Comes = 10.4

1835.1	10°.0	12″.±	*h*	1 n

Seen in 1897; no great change shown.

No. 50. Washburn 76. B.D. MAG. 9.3
— 14°, 1171.
5h 29m 32s — 14° 25′.8.

A = 10.1 B = 10.3 C = 11.8

A and B

1888.9	252°.2	1″.80	Washburn	2 n

A and C

1888.5	219°.6	2″.76	Washburn	4–2 n

No. 51. β 13. W.B. 5 h. 676. 8.0
5h 29m 36s — 4° 33′.2.

8.3 and 9.4

1876.1	128°.8	1″.38	Dembowski	1–2 n
1879.1	131.8	0.99	Cinc.	1
1892.0	131.6	1.10	β	3

Fixed.
Another double star in the field—see No. 53.

No. 52. Harvard. Lac. 1922. 6.6
5h 29m 40s — 64° 0′.2.

Noted as having a *comes* within 30″.
See *Harvard Circular*, No. 18.

No. 53. Σ 743. Pos. Med. 602. 8.0
5h 29m 46s — 4° 27′.5.

8.4 and 9.2

1830.7	277°.8	1″.82	Σ	4 n
1857.9	276.8	1.7 ±	Dembowski	1
1887.1	276.8	1.78	Tarrant	5

No change.

No. 54. θ Orionis. Nebula.
5h 30m 25s — 5° 28′.0.

The celebrated trapezium.
A very full description by β will be found in the *M. N. R. A. S.*, vol. xlix., 1889, or *Lick Publications*, vol. ii. He considers the stars fixed and sees no variability.
It may here be remarked that none of the many close pairs in Orion show certain signs of motion.

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No. 55. Dawes 4. c Orionis. MAG. 4.6
5h 30m 27s — 4° 54′.2.

Comes = 8.6

1853.1	219°.1	1″.65	Jacob	3–1 n
1866.9	214.7	.....	Harvard	1
1876.1	217.7	1.73	Dembowski	4–3
1879.9	214.7	1.64	Cinc.	2
1892.1	214.2	1.54	Haverford	2
1893.0	217.8	1.80	„	2

This fine and somewhat difficult pair, although found in England, is not included in most English catalogues of double stars.

Fixed.

Two stars closely following, one = 5.0 mag.

No. 56. ℍ. III. 12. ι Orionis. 3.0
5h 30m 32s — 5° 58′.5.

Comes = 8.3

1781	133°.9	.....	ℍ	1 n
1820	141.5	.....	Σ	1
1832	142.2	11.3	„	3
1854	141.9	11.1	Morton	4
1867	142.0	11.4	Dembowski	3
1887	140.6	11.2	Tarrant	2

Many more distant stars.

The p.m. is small.

Also called Σ 752.

No. 57. ℍ. II. 26. W.B. 5 h. 706. 7.0
5h 30m 34s — 4° 25′.8.

C. G. A. 6488 = 9.0

1831.2	59°.2	4″.29	Σ	3 n
1866.4	61.7	4.09	Dembowski	3
1877.3	59.0	4.65	Cinc.	4
1887.1	60.6	4.43	Tarrant	5
1893.1	61.3	3.85	Glasenapp	2

Also recorded as Σ 750.

No. 58. Dawes 3. Lal. 10,567. 8.2
5h 31m 0s — 5° 41′.6.

8.6 and 9.4

1859.4	183°.7	1″.±	Dawes	3 n
1866.9	182.2	.....	Harvard	1
1875.4	174.9	1.06	Dembowski	4–2

A 7.8 mag. star is about 21 secs. f.

The Harvard angle is printed 128°.2.

No. 59. Σ 754. Lal. 10,590. MAG. 6.6 White
5h 31m 43s — 6° 7′.6

Comes, C. G. A. 6511 = 9.9 blue

1830.1	287°.6	5″.17	Σ	3 n
1867.1	287.6	5.18	Dembowski	3
1879.7	286.3	5.40	Cinc.	1

No. 60. β 1050. Bond 974. 10.2
5h 31m 54s — 5° 23′.

10.5 and 11.7

1889.0	283°.6	0″.67	β	3 n

In the great nebula, 5′ S. 92 secs. f. θ_1 Orionis :—β.

No. 61. Σ 757. W.B. 5 h. 747. 8.9
5h 32m 24s — 0° 18′.0.

9.5 and 9.8, both white

1831.2	239°.8	1″.68	Σ	3 n
1868.8	239.3	1.70	Dembowski	3
1878.6	239.6	1.50	Cinc.	2
1893.2	243.7	0.9 ±	Glasenapp	2

An 11″ pair, ℍ. III. 111 = Σ 758, is 51″ f.

No. 62. β 89. Lal. 10,608. 9.1
5h 32m 31s — 1° 28′.9.

9.3 and 10.8

1875.7	344°.2	0″.55 ±	Dembowski	3 n
1878.4	356.1	0.81	Cinc.	2–1
1879.6	361.6	0.73	β	4
1886.7	355.6	1.01	L. McC.	1
1888.5	360.1	0.88	Haverford	2

The mag. which is from the B.D., seems too faint. It agrees, however, with Bessel's determination = 9.0.

Estimates of the chief star by the double star observers vary from 6.6 to 8.0.

S.f. ε Orionis.

No. 63. β 1051. Bond 1096. 9.6
5h 33m 20s — 4° 57′.0.

10.1 and 10.7

1889.1	24°.7	0″.75	β	3 n

S.f. Lal. 10,628, mag. 6.7.

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No. 64. β 1032. σ Orionis. MAG. 3.7
5h 33m 43s — 2° 39′.4.

3.9 and 5.6

1888.81	357°.0	0″.26	β	4 n
1890.81	351.6	0.29	,,	3
1891.88	349.7	0.23	,,	3

Another star 13″ away.

Followed by Piazzi 5 h. 173 and 174, two 8.5 mag. stars.

No. 65. β 321a. Lal. 10,726. 6.7
5h 34m 52s — 17° 54′.3.

7.0 and 8.3

1877.1	143°.6	1″.00	Cinc.	1 n
1877.3	144.5	0.68	Dembowski	3
1879.5	139.2	0.99	β	3
1888.9	141.2	0.76	Haverford	2

There are several fainter stars in the field—among them the double star Lal. 10,728. See No. 66.

No. 66. β 321b. Lal. 10,728. 8.6
5h 34m 56s — 17° 55′.4.

9.1 and 9.8

1877.1	360°.2	1″.49	Cinc.	1 n
1877.3	357.7	1.26	Dembowski	4
1879.5	359.4	1.49	β	3
1888.9	358.8	1.40	Haverford	2

β 321a is 89″ N.pr. See No. 65.

No. 67. h. 3784. Lac. 1944. 8.2
5h 35m 22s — 46° 8′.8.

Comes = 9.5

1836.5	49°.9	3′.±	*h*	2 n
1852.1	56.0	5.±	Gilliss	1
1879.1	58.6	4.65	Hargrave	1
1895.2	62.1	5.18	Sellors	3

The change probably arises from p.m. in one of the stars.

Both stars separately observed on the meridian at Cordoba.

No. 68. β 322. Ö.A. 4178. MAG. 8.3
5h 35m 29s — 25° 12′.1.

8.5 and 10.0

1877.1	104°.2	2″.10	Cinc.	1 n
1894.1	104.3	1.97	Sellors	2

Ö.A. 4176, mag. 7.6, is 6′ S.pr.

No. 69. Kunowsky. ζ Orionis. 1.9
5h 35m 43s — 1° 59′.7.

Comes = 5.4

1825.2	153°.3	2″.34	Σ	5 n
1831.2	151.3	2.35	,,	6
1836.2	151.3	2.55	,,	5
1853.9	153.7	2.98	Morton	4
1866.1	152.4	2.86	Talmage	3
1866.8	151.9	2.61	Dembowski	3
1872.1	153.8	2.28	Dunér	9
1878.5	151.7	2.51	Cinc.	2
1880.5	151.8	2.87	β	2
1887.0	152.8	2.62	Tarrant	3
1889.2	158.3	2.70	Maw	3
1893.1	157.5	2.84	Glasenapp	2

Another star noted by H, mag. 9.5, N.f. 57″.

No certain change.

Also known as Σ 774.

No. 70. Harvard. α Columbæ. 2.7
5h 36m 1s — 34° 7′.6.

According to *Harvard Circular*, No. 18, this star has a companion within 30″, seen at Arequipa in 1891.

No. 71. h. 3789. C. Z. 5 h. 1318–9. 8.9
5h 36m 36s — 50° 11′.1.

Comes = 9.5

1837.0	3°.6	10″.±	*h*	1 n
1849.1	0.7	9.14	Jacob	3
1873.1	358.0	9.14	Russell	1

No. 72. Innes 277. Bris. 1025. 8.0
5h 36m 38s — 71° 11′.8.

8.1 yellow, and 11.0

1898.3	190°.±	3″.5 ±	Innes	2 n

Near three bright nebulæ. A wider pair is N.pr. = *h* 3783.

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No. 73. β 1052. Lal. 10,776. MAG. 6.7
5h 36m 39s —2° 56′.8.

7.1 and 8.1

1889.14	189°.1	0″.66	β	3 n

No. 74. γ Leporis. 3.8
5h 40m 18s — 22° 28′.8.

Comes, Bradley 836, = 7.3

1879.0	349°.4	94″.91	Cape M.O.	2 n
1889.2	349.6	95.25	Hall	2

Common p.m. of 0″.480 towards 220°.9.

No. 75. Washburn 77. 1st Mun. 1493. 9.0
5h 40m 39s — 15° 12′.0.

9.4 and 10.4

1888.4	293°.4	1″.86	Washburn	3–2 n

No. 76. Σ 790. Lal. 10,936. 6.7 Orange
5h 41m 5s — 4° 18′.4.

Comes = 9.7 blue

1830.8	89°.1	6″.82	Σ	3 n
1851.2	88.2	7.11	Jacob	2
1866.4	89.3	6.81	Dembowski	3
1884.5	88.3	6.95	Cinc.	2

Both stars observed on the meridian at Cordoba.
Also called South 497.

No. 77. Innes 278. Bris. 1050. 8.5
5h 42m 37s — 68° 45′.3.

8.7 and 10.2

1898.3	180°.±	1″.±	Innes	1 n

Closely N.f. Lac. 2037, mag. 7.5.
In the nubecula major, near the looped nebula.

No. 78. β 15. W.B. 5 h. 1022. MAG. 8.0
5h 42m 46s — 2° 19′.9.

8.1 and 10.4

1875.6	174°.3	2″.07	Dembowski	2 n
1878.1	177.9	1.67	Cinc.	1
1886.9	179.8	2.08	L. McC.	2

No. 79. λ 55. C. Z. 5 h. 1577. 8.5
5h 42m 53s — 47° 25′.3.

8.6 and 11.5

1897.1	308°.8	0″.90	See	2 n

No. 80. Innes 279. C. Z. 5 h. 1580. 8.5
5h 42m 59s — 43° 18′.2.

8.8 and 10.1

1898.3	350°.±	0″.7 ±	Innes	1 n

A 9.7 star is pr.

No. 81. h. 3802. Lac. 2012. 8.1
5h 43m 24s — 55° 45′.7.

Comes = 9.6

1834.9	305°.6	4″.±	*h*	1 n
1873.1	308.5	6.98	Russell	1

Separately observed on the meridian at Cordoba.

No. 82. Washburn 78. B.D. —12°,1275. 9.0
5h 44m 1s — 12° 49′.0.

9.7 and 9.9

1888.2	167°.7	1″.84	Washburn	3 n

No. 83. h. 3799. Ö.A. 4329. 8.6
5h 44m 3s — 18° 44′.0.

9.2 and 9.6

1835.9	148°.5	2″.5 ±	*h*	1 n
1877.1	149.1	4.25	Cinc.	1

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No. 84. Jacob [3]. Lal. 11,086. MAG. 5.8
5h 45m 4s — 14° 30′.8.

6.0 and 8.0

1845.8	185°.2	1″.8 ±	Jacob	1 n
1846.4	184.0	1·8 ±	,,	1
1876.2	179.4	2.73	Dembowski	4
1878.1	182.6	2.29	Cinc.	1
1881.1	182.5	2.72	β	1
1888.1	178.8	2.82	Haverford	3
1893.0	178.6	2.48	,,	2

Jacob's R.A. was 20_m in error, probably by a slip of the pen, as it was observed by him twice, and the star was rediscovered independently as β 94.

Very slow change shown.

No. 85. β 1188. Lal. 11,084. 8.2
5h 45m 34s — 1° 27′.4.

8.4 and 10.9

1890.8	106°.0	1″.23	β	3 n

Perhaps noted as double at Göttingen. See Zone Observations, 1869.

A 9.0 mag. star 25″ S.f. makes with β 1188 the old pair Σ 809.

No. 86. Innes 63. Lac. 2024. 7.1
5h 45m 39s — 48° 57′.0.

7.3 and 9.0

1897.0	8°. ±	1″.3 ±	Innes	3 n

Independently discovered at Sydney by Mr Sellors in January 1897.

A 10m star S.f. 90″ ±

No. 87. h. 3812. C. Z. 5 h. 1844. 8.6
5h 48m 24s — 59° 52′.0.

9.2 and 9.6

1836.0	190°.9	2″.5 ±	*h*	1 n
1873.1	190.3	2.43	Russell	1

No. 88. h. 3807. C. Z. 5 h. 1824. MAG. 8.3
5h 48m 30s — 41° 42′.4.

Comes = 9.5

1837.1	267°.3	4″. ±	*h*	1 n
1880.9	pr.	3. ±	C. G. A.	3

No. 89. Innes 64. Piazzi 5 h. 274. 5.6
5h 49m 8s — 37° 39′.1.

Comes = 11.2

1896.9	250°. ±	10″. ±	Innes	1 n

C. P. D. mag. = 6.8.

Another star = 11m N.f. at a greater distance.

No. 90. Innes 16. Piazzi 5 h. 278. 7.0 Orange
5h 49m 27s —38° 32′.9.

Comes = 11.0

1896.2	121°.9	1″.54	Sellors	3 n

No. 91. Sellors 15. Lac. (1680) = Bris. 1099 6.9
5h 52m 17s — 61° 51′.4.

7.4 and 7.9

1895.1	324°.4	0″.71	Sellors	3 n

No. 92. Σ 826. Göttingen 1792. 8.7
5h 53m 50s — 1° 20′.0.

9.1 and 10.1

1832.4	115°.5	1″.84	Σ	4 n
1867.4	122.2	2.22	Dembowski	3
1877.7	125.7	2.18	β	2
1878.1	124.4	2.09	Cinc.	1
1886.9	121.0	1.94	L. McC.	1

No. 93. Cape 5. Lac. 2086. 7.7
5h 53m 58s — 41° 46′.0.

8.3 and 8.7

1895.1	210°.1	1″.67	Sellors	3 n
1897.2	209.4	1.82	See	2

Independently noted at Cordoba in 1876.

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No. 94. South 504. Lal. 11,376. MAG. 8.6
5h 54m 10s — 20° 10′.4.

Comes = 8.9

1851.2	73.7*	3.59	Jacob	3–2 n
1877.5	70.3	3.78	Cinc.	2
1883.4	71.3	4.00	,,	2–1

Other measures.

No. 215 in Struve's first catalogue.

No. 95. Innes 155. Lac. 2092. 8.0
5h 55m 33s — 33° 49′.6.

8.2 and 10.2

1897.1	20.±	1.5±	Innes	1 n

Piazzi 5h 320 mag. 5.9 orange (C. P. D. mag. 7.4), is some way S.f.

No. 96. β 564. 1st Mun. 1636. 9.3
5h 56m 0s — 1° 34′.3.

9.5 and 11.3

1878±	90.±	1.±	β	1 n
1892.0	70.9	1.29	,,	2

No. 97. h. 3823. C. Z. 5 h. 2152. 7.5
5h 56m 37s — 31° 2′.8.

8.2 and 8.4, both orange

1836.9	130.5	4.84	*h*	4 n
1851.1	130.5	4.00	Jacob	2
1852.4	130.3	3.93	Maclear	2
1856.1	129.8	3.75	Secchi	1
1877.0	121.0	3.82	Cinc.	2
1881.1	123.0	2.88	Pritchett	1
1888.1	115.3	3.04	Haverford	2
1894.1	115.0	2.30	Sellors	1
1896.0	114.9	.....	Doberck	2

Angle and distance decreasing.

In the C. P. D. the combined mag. = 8.6.

See :—

1888. Leavenworth, H. P., "Motion," *Sidereal Messenger*, vol. vii. p. 172.

No. 98. β 16. 3 Monocerotis. MAG. 5.1
5h 57m 8s — 10° 35′.9.

5.2 and 8.4

1875.6	354.8	1.62	Dembowski	2 n
1878.2	354.9	1.68	Cinc.	1
1889.0	353.9	1.88	Haverford	4–3

In the *Radcliffe* 1890 *Catalogue* this is noted as a pale blue star.

Small common p.m.

No. 99. Σ 836. W.B. 5 h. 1417. 8.3
5h 57m 30s — 2° 21′.7.

8.5 and 10.7

1832.5	27.8	1.93	Σ	3 n
1867.8	31.7	2.00	Dembowski	3

No. 100. λ 58. Ö.A. 4575. 9.1
5h 58m 36s — 21° 48′.3.

9.2 and 12.5

1897.8	206.2	1.72	See	1 n

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No. 1. h. 3831. C.Z. 6 h. 13. MAG. 7.7
6h 1m 4s — 41° 9′.0.

Both = 8.5

	°	″		
1837.0	135.2	2.5 ±	*h*	2 n
1854.1	136.2	2.70	Jacob	2
1879.2	134.3	2.56	Hargrave	1
1896.0	134.1	.....	Doberck	2

No. 2. Argelander [1]. Ö.A. 4618. 7.8
6h 1m 10s — 25° 1′.2.

8.5 and 8.7

	°	″		
1876.0	295.6	4.69	Cinc.	5 n
1879.2	293.6	4.67	,,	2

No. 3. h. 3834. Piazzi 5 h. 348. 5.8
6h 1m 48s — 45° 4′.7.

5.9 and 8.8, both yellow

	°	″		
1837.9	247.7	1.3 ±	*h*	1 n
1854.1	237.3	2.58	Jacob	2
1873.1	230.6	3.04	Russell	1
1895.1	226.4	3.62	Sellors	3
1897.1	224.7	3.75	See	6–5

Change.

Common p.m. of 0″.256 towards 348°.0, which is very similar in amount and direction to that of Piazzi 5h, 346, a star of the 6.4 mag. about 3′ N.pr.

Both components of *h* 3834 have been observed on the meridian at Cordoba.

In the first *Sydney Catalogue of Double Star Measures* this system is erroneously referred to as "After *h* 3834."

No. 4. Dunlop 23. Lac. 2145. 6.9
6h 2m 11s — 48° 26′.9.

7.6 and 7.8

	°	″		
1826.	329.	3. ±	Dunlop	1 n
1835.0	342.5	3.86	*h*	1
1846.8	347.6	3.33	Jacob	2
1854.2	352.2	2.28	,,	2
1856.5	354.1	2.30	,,	4
1873.1	2.1	2.90	Russell	1
1881.2	11.4	2.46	Tebbutt	2
1882.2	11.6	2.35	Russell	1
1892.3	25.4	1.35	Sellors	3
1897.0	32 8	1.92	Tebbutt	3

Many other measures.

Common p.m. of 0″.11 towards 243°.3.

Mr Tebbutt has called attention to the magnitude of the chief star, which has been rated from 6.0 to 8.5 in a series which suggests a period of fourteen years more or less. It has, however, never been rated less than the other component.

Called *h* 3835 in error in the first *Sydney Catalogue*. See :—

1881. Tebbutt, J., "Motion," *Observatory*, vol. iv. p. 211.

No. 5. Σ 850. W.B. 5 h. 1554. MAG. 9.2
6h 2m 23s — 3° 58′.8.

Comes = 11.0

	°	″		
1832.5	15.8	2.09	Σ	3 n
1867.5	16.7	2.22	Dembowski	3

No. 6. Triple. 4 Monocerotis. 6.8
6h 3m 44s — 11° 7′.8.

A = 6.9, B = 10.6, C = 11.5
A and B = β 17

	°	″		
1875.9	178.0	3.16	Dembowski	3 n
1878.1	182.8	2.59	Cinc.	1
1889.1	179.6	3.01	Haverford	2
1892.0	180.4	3.21	β	3

A and C = Knott.

	°	″		
1876.8	244.5	8.95	Dembowski	1 n
1892.0	246.8	8.77	β	3

The p.m. of the chief star is about 0″.03.

No. 7. β 565. Lal. 11,741. 8.2
6h 4m 36s — 14° 2′.9.

8.3 and 10.9

	°	″		
1878.2	100.4	1.02	β	1 n
1892.1	99.9	1.13	,,	3

No. 8. β 1242. Schj. 2066. 9.0
6h 4m 38s — 6° 18′.5.

9.7 and 9.9

	°	″		
1891.87	124.5	0.48	β	3 n

In the centre of a faint diffused nebula, $H_{\frac{I}{g}}$ IV. 38.

Another star, 10.7 mag., 44″ away, constitutes with β 1242 the pair *h* 2298.

A 7.5 mag. star is 13′ S.

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No. 9. Innes 280. C. Z. 6 h. 256. MAG. 9.0
6h 6m 35s — 46° 15′.8.

Comes = 11.5

1898.3	280.° ±	4.″ ±	Innes	1 n

C.Z. 6 h. 260, mag. 9.0, is 7 secs. f. 4′ S.
The magnitudes [from C. G. A.] are considerably underrated.

No. 10. Alvan Clark 3. Lal. 11,793. 6.6
6h 6m 47s — 4° 38′.6.

6.8 and 8.3

1854.1	.....	1.″1 ±	A. Clark	1 n
1858.1	170.0	0.85 ±	Jacob	2
1875.7	169.8	0.98	Dembowski	3–2
1892.1	173.8	0.87	β	3
1898.0	174.8	1.00	Aitken	4

"Little or no change":—Aitken.

No. 11. λ 62. Lal. 11,846. 8.7
6h 7m 2s — 22° 48′.1.

9.4 and 9.5

1897.8	96.°4	0.″50	See	2 n

Prof. See also measures a 13th mag. star 25″ distant.

No. 12. β 1017. W.B. 6 h. 124. 9.0
6h 7m 28s — 2° 55′.4.

9.7 and 9.9

1883. ±	180.° ±	0.″8 ±	β	1 n
1892.0	161.1	0.65	„	3

No other measures.

No. 13. Cordoba [14]. C. Z. 6 h. 333 8.8
6h 8m 24s — 40° 23′.4.

9.2 and 10.0

1897.1	40.°7	1.″81	See	2–3 n

The middle of three stars.

No. 14. β 566. Lal. 11,916. MAG. 5.6
6h 9m 40s — 4° 32′.3.

Comes = 11.0

1878.0	219.°7	1.″43	β	1 n
1892.1	209.9	1.87	„	3

In the *Radcliffe* 1890 *Catalogue* this is noted as a green star.

No. 15. β 323. Lal. 11,915. 8.3
6h 9m 45s — 1° 41′.3.

8.5 and 10.2

1876.3	96.°3	2.″40	Dembowski	2 n
1878.1	93.5	2.16	Cinc.	1
1888.2	96.3	2.14	Hall	2
1889.1	96.9	2.26	Haverford	3

No. 16. β 567. Lal. 11,949. 6.1
6h 10m 34s — 4° 52′.9.

Comes = 10.9

1879.1	249.°5	3.″83	β	4 n
1892.0	246.8	3.97	„	3

No. 17. Innes 3. Lac. 2224. 6.9
6h 11m 30s — 61° 26′.7.

7.3 and 8.3

1896.1	9.°7	1.″07	Sellors	3 n

No. 18. [Dunlop 26]. Lac. [2275]. 7.4
6h 11m 57s — 65° 30′.4.

Comes = 8.2

1836.2	114.°9	21.″5	*h*	3 n
1871.6	115.8	20.9	Russell	2
1879.2	116.8	20.5	Hargrave	1
1885.2	116.8	20.5	Tebbutt	1

The companion is Cape 1880, 2888.
In Lacaille and the first *Sydney Catalogue* the R.A. of the chief star, which is Bris. 1201, is erroneous.

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No. 19. β 18. Lal. 12,006. MAG. 7.0
6h 12m 3s — 12° 0′.7.

7.3 and 8.7

1876.0	271.9	1.79	Dembowski	3 n
1878.0	273.5	1.54	Cinc.	1
1885.1	276.9	1.77	„	1
1886.5	275.9	1.68	L. McC.	2
1892.9	273.5	1.21	Haverford	1

No. 20. β 1019. W.B. 6 h. 287. 9.1
6h 12m 26s — 3° 0′.7.

Comes = 10.7

1892.1	274.2	0.81	β	3 n

W.B. 6 h. 288, mag. 9.1, is 5 secs. f. 3′.7 S.

No. 21. Hough 338. Lal. 12,079. 8.3
6h 13m 56s — 18° 22′.6.

8.5 and 10.3

1890.2	286.9	1.95	Hough	1 n

No. 22. Σ 3116. Lal. 12,176. 5.3
6h 16m 45s — 11° 43′.6.

Comes = 9.1

1831.2	19.2	4.48	Σ	5 n
1847.1	25.1	3.86	Jacob	1
1864.7	24.0	3.85	Dembowski	5
1881.2	24.0	4.26	Cinc.	2–1

See :—

1886. Gore, J. E., "Rectilinear Motion," *M. N. R. A. S.*, vol. xlvii. p. 61.

No. 23. Innes 281. C. Z. 6 h. 787. 8.7
6h 17m 49s — 44° 44′.7.

Comes = 10.5

1898.1	N.	4.″ ±	Innes	1 n

The pr. star of a triangle in the finder.

No. 24. β 568. Lal. 12,288. MAG. 6.9
6h 19m 28s — 19° 44′.0.

7.2 and 8.3

1878.2	155.1	[1.″35]	β	1 n
1878.2	161.0	.....	Cinc.	1
1889.1	148.3	0.80	Haverford	4–1
1892.4	155.2	1.07	„	2–1

Ö.A. 5074, mag. 8.5, = Hough 339, a 5″ pair, is about 64 secs. f. 4′ N.

No. 25. β 97. Lal. 12,260. 7.2
6h 19m 30s — 1° 21′.8.

7.5 and 8.8

1876.0	257.8	1.″15	Dembowski	3 n
1878.1	261.2	1.10	Cinc.	2
1889.1	260.9	0.93	Haverford	2–1

No. 26. β 569. Lal. 12,315. 7.8
6h 20m 33s — 10° 53′.2.

8.0 and 10.0

1878.0	120.7	1.″84	β	1 n
1878.6	118.8	1.54	Cinc.	2
1886.9	115.2	1.99	L. McC.	2

No. 27. h. 3857. Piazzi 6 h. 110. 5.6
6h 20m 33s — 36° 39′.3.

Comes = 8.8

1836.5	260.8	12.″ ±	*h*	2 n
1882.2	254.9	12.24	Hargrave	1
1897.0	255.3	12.81	See	2

Some evidence of a small common p.m.
C. P. D. mag. = 7.2.
Both stars observed on the meridian at Cordoba.
Piazzi 6 h. 112, mag. 7.0, is N.f.

No. 28. Innes 282. Lac. 2287. 7.7
6h 21m 41s — 50° 28′.5.

7.9 and 9.9

1898.3	300.° ±	1.″ ±	Innes	1 n

2° 10′ N. of Canopus.

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No. 29. λ 66. Canopus. MAG. —1.0
6h 21m 44s — 52° 38′.5.

Comes = 15.0

1897.0	160°. ±	30″. ±	See	1 n

In a fine low power field.

No. 30. h. 3858. Gilliss 277. 7.2
6h 22m 3s — 34° 58′.8.

7.6 and 8.6

1836.0	315°.5	3″. ±	*h*	1 n
1849.5	316.7	3.70	Jacob	3
1857.9	315.2	3.53	,,	2
1876.6	313.3	4.03	Cinc.	1–2
1877.1	311.7	4.25	,,	1
1897.1	316.8	3.00	Scott	1
1897.1	316.4	3.86	See	2

h's Dec. is 1° in error.

Separately observed on the meridian at Cordoba.

Lac. 2274, mag. 6.2 (C. P. D. mag. 7.4), is 128″ S.pn

No. 31. Innes 156. G Puppis. 6.0
6h 23m 5s — 48° 7′.0.

6.1 and 9.0

1897.2	127°. ±	0″.95 ±	Innes	2 n

No. 32. Triple. β Monocerotis. 3.9
6h 23m 58s — 6° 58′.1.

A = 4.0 B = 7.8 C = 8.2

A and B = H II. 17

1831.2	130°.0	7″.25	Σ	3 n
1854.2	131.2	7.34	Dembowski	5
1889.2	130.6	6.94	Glasenapp	2

B and C = H I. 10

1831.2	101°.7	2″.46	Σ	3 n
1854.2	101.6	2.53	Dembowski	5
1886.8	102.6	2.47	L. McC.	1

A and C

1831.2	122°.9	9″.49	Σ	3 n

Common p.m. of 0″.076 towards 296°.4, but the stars are relatively fixed.

Also called Σ 919.

β notes a 12.5 mag. star 26″ distant = β 570

No. 33. β 753. Piazzi 6 h. 138. MAG. 6.0
6h 24m 56s — 32° 18′.4.

6.2 and 7.9

1879.8	40°. ±	1″.2 ±	β	1 n
1892.1	47.2	1.29	,,	3
1893.1	37.3	1.17	Sellors	2
1897.1	38.2	1.36	Aitken	3
1897.1	45.4	0.93	See	2

"A very fine pair":—β

Sometimes misidentified with λ Canis Majoris, mag. 4.7, which is 28 secs. pr. 13′ S.

No. 34. h. 3863. Lal. 12,509. 7.2
6h 25m 13s — 22° 31′.5.

Comes = 9.2

1835. ±	121°. ±	2″. ±	*h*	1 n
1877.1	116.1	2.70	Cinc.	2

No. 35. h. 3866. Ö.A. 5202. 8.1
6h 26m 16s — 24° 4′.4.

Comes = 9.6

1877.6	135°.1	4″.24	Cinc.	4 n

The only set of measures found.

Separately observed on the meridian at Cordoba.

No. 36. Sellors 7. Lac. 2333. 5.3
6h 27m 22s — 50° 10′.1.

5.7 and 6.7

1879.2	267°.1	0″.72	Russell	1 n
1893.1	265.2	0.68	Sellors	3
1897.1	274.7*	0.69	See	2–3

The original announcement of the discovery of this pair suffered so much from errors in printing that it passed unnoticed. The rediscovery of the pair by Mr Sellors gave a solution of the misprints.

Formerly called Z Puppis.

There is an 8.6 mag. star some distance away, composing with the above pair the old pair, Dunlop 30.

1835.9	317°.8	13″.6	*h*	2 n
1879.2	318.0	12.5	Russell	1
1880.0	313.9	13.1	Cruls	3
1897.1	315.6	13.2	See	3

Mr Russell's measure is set against No. 65 in his list of new double stars.

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No. 37. Innes 4. Lac. 2320. MAG. 6.6
6h 27m 26s — 40° 22′.6.

7.2 and 7.6

1895.6	320.° ±	1.″ ±	Innes	3 n
1896.1	302.2	1.30	Sellors	3
1897.2	301.7	0.76	Lowell	2

No. 38. β 98. Lal. 12,564. 7.9
6h 27m 45s — 5° 15′.9.

8.6 and 8.8

1876.1	140.°8	1.″05	Dembowski	3–2 n
1878.0	138.3	0.7 ±	Cinc.	1
1878.1	134.7	0.52 ±	,,	1

No. 39. h. 3874. μ Pictoris. 5.8
6h 30m 29s — 58° 40′.7.

6.0 and 8.2

1836.5	230.° 5	2.″9 ±	*h*	2 n
1894.1	236.2	2.05	Sellors	1

No. 40. β 754. Piazzi 6 h. 177. 7.0
6h 31m 5s — 33° 55′.8.

7.7 and 7.9

1879.8	20.° ±	0.″5 ±	β	1 n
1892.1	22.8	.....	Haverford	1
1892.2	36.5	0.78	β	2
1897.8	16.2	0.92	See	1

No other measures found.

A 10th mag. comes 25″ pr., and another more distant star N.f.

No. 41. Innes 178. C. Z. 6 h. 1403. 8.3
6h 31m 12s — 32° 13′.6.

8.6 and 9.8

1897.3	205.° ±	0.″8 ±	Innes	2 n

A faint star to the N.

No. 42. β 755. Piazzi 6 h. 182. MAG. 5.7
6h 31m 56s — 36° 41′.9.

6.1 and 7.1

1879.8	250.° ±	1.″ ±	β	1 n
1887.2	253.1	0.78	Pollock	3–2
1891.1	252.7	0.91	Sellors	1
1897.2	260.6	1.09	See	1

Another star 10th mag. 21″ distant makes with the above the old pair *h* 3875.

Recorded as a new triple star in 1897. See *Harvard Circular*, No. 18.

No. 43. Cape 6. Lac. 2362. 7.7
6h 32m 1s — 38° 43′.7.

8.4 and 8.5

1891.1	59.°2	1.″ ±	Sellors	2 n
1893.1	60.2	1.11	,,	2
1897.1	61.6*	1.05	See	2

First noted at the Cape about 1877.5.

A 10th mag. *comes* closely N.f.

No. 44. Ormond Stone. W.B. 6h. 989. 9.0
6h 34m 50s — 7° 56′.3.

9.5 and 10.0

1878.1	228.°5	0.″9 ±	Cinc.	1 n

Identification somewhat uncertain.

No. 45. Dunlop 31. Lac. 2402. 5.0 Yellow.
6h 35m 58s — 48° 7′.8.

Companion = 7.5 blue

1835.9	317.° 0	13.″4	*h*	3 n
1847.2	318.7	13.3	Jacob	2
1857.0	319.0	13.1	,,	2
1872.1	319.3	13.0	Russell	1
1881.2	318.2	12.7	Tebbutt	1

Indexed in error as *h* 3883 in Mr Russell's catalogue.

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No. 46. Σ 955. Lal. 12,876. MAG. 8.2
6h 36m 22s — 7° 53′.6.

A = 9.1 B = 9.7 C = 9.2

A and B

1830.6	272°.6	0″.88	Σ	4 n
1836.2	266.5	0.89	,,	1
1857.1	276.3	1.09	Secchi	1
1872.3	265.9	0.95	Dembowski	6–2
1878.6	270.7	0.92	β	2
1886.7	270.7	0.92	L. McC.	2–1
1889.2	271.5	0.95	Hall	3

A and C

1831.4	188°.4	11″.4	Σ	4 n
1857.1	188.7	11.3	Secchi	1
1878.1	189.4	11.5	β	1

Other measures.
All evidently fixed.
β notes a faint star 15″ S. of C.
No. 44 is S.pr.

No. 47. Innes 5. Lac. 2432. 6.6
6h 36m 56s — 61° 26′.7.

6.8 and 8.8

1896.1	271°.4	2″.40	Sellors	3 n

The chief star has a p.m. of 0″.1.

No. 48. λ 70. Lac. 2422. 7.5
6h 37m 23s — 52° 44′.4.

8.2 and 8.3

1897.1	117°.1	0″.46	See	2–1 n

No. 49. β 19. Lal. 12,936. 7.5
6h 37m 30s — 15° 54′.7.

Comes = 9.8

1872.1	169°.4	4″.07	Knott	1 n
1876.3	165.0	3.52	Dembowski	3
1877.1	165.5	3.64	Cinc.	2
1880.8	166.1	3.65	β	3
1885.6	168.7	3.58	Cinc.	2
1888.1	166.6	3.70	Haverford	3

Separately observed on the meridian at Cordoba.

No. 50. β 195. Lac. 2404. MAG. 7.5
6h 38m 17s — 23° 8′.1.

Comes = 10.0

1876.1	S.pr.	5″.±	C. G. A.	3 n
1877.1	217°.6	6.05	Cinc.	1

No. 51. Cordoba [15]. C. Z. 6 h. 1789. 8.7
6h 38m 41s — 37° 54′.4.

Comes = 10.1

1880.9	S.pr.	4″.±	C. G. A.	2 n

No. 52. Dunlop 32. Piazzi 6 h. 223. 6.9
6h 38m 53s — 38° 18′.0.

Comes = 7.7

1835.4	276°.1	8″.43	*h*	2 n
1851.1	277.2	7.97	Jacob	2
1876.1	275.4	7.92	Cinc.	1
1879.2	277.8	8.03	Hargrave	1
1893.1	274.8	8.34	Scott	1
1896.0	278.0	7.30	Doberck	3–2
1897.1	277.0	7.97	See	4

The p.m. is inconsiderable.

No. 53. Innes 283. C. Z. 6 h. 1837. 8.0
6h 39m 21s — 42° 28′.4.

8.2 and 10.2

1898.3	190°.±	2″.±	Innes	1 n

No. 54. A. G. Clark 1. Sirius. —1.4
6h 40m 44s — 16° 34′.7.

Comes = 10.0

1862.2	84°.6	10″.07	Bond	3 n
1872.2	64.3	11.46	Hall	6
1882.2	42.5	9.67	,,	7
1885.3	34.7	8.06	,,	8
1888.2	23.3	5.78	,,	5
1890.3	359.7	4.19	β	3
1897.2	185.4	3.88	Aitken	4–3

[*contd.*

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The history of this binary is well known.

Prof. See gives the following elements for the orbit:—

$$P = 52.2 \text{ years}$$
$$T = 1893.5$$
$$e = 0.62 \qquad a = 8''.03$$
$$i = 46^\circ.8 \qquad \Omega = 34^\circ.3$$
$$\lambda = 131.0$$

and this ephemeris:—

1899.2	158°.9	4".97
1900.2	149.5	5.25

and further, adopting [1] a parallax of 0".38, and Prof. Auwers' ratio of the masses of the two bodies, he finds the semi-axis major to be 21.1 times that of the Earth's, the mass of Sirius = 1.1 times, and the mass of the companion = 2.36 times that of the Sun.

The mean p.m. of Sirius is about:—

1".2 towards 195°.

According to the Potsdam spectroscopic observations, Sirius is approaching the Sun at 10 miles per second. This rate is, however, not the mean rate of the system which is still unknown.

There are several faint stars over 40" distance.

This double star is the subject of many papers, two very complete ones being:—

1891. Burnham, S. W., *M. N. R. A. S.*, vol. li. pp. 378–388.

1892. Auwers, A., "Beiträge zur Kenntniss des Sirius-Systems," *Astr. Nachr.*, Bd. cxxix. No. 3084–5.

These two excellent papers, with the references they give, bring our knowledge of the system to the time of disappearance of the companion in 1890.

1894. Howard, C. P., "Orbit," *Astronomy and Astrophysics.*

1894. Roberts, A. W., "Orbit," *Ast. Journal*, vol. xiv. No. 328.

1896. See, T. J. J., ["Rediscovery,"] *Ast. Journal*, vol. xvii. No. 385.

1896. Holden, E. S., ["Rediscovery,"] *Ast. Journal*, vol. xvii. No. 388.

1896. Hussey, W. J., "Brightness of Companion," *Pub. Ast. Soc. Pac.*, vol. viii. No. 50.

1896. Aitken, R. G., "Measures," *Ast. Journal*, vol. xvii. No. 388.

1896. Aitken, R. G., "Measures," *Astr. Nachr.*, No. 3389.

1896. Brown, S. J., "Observations," *Ast. Journal*, vol. xvii. No. 390.

1896. Roberts, A. W., "Orbit," *Astr. Nachr.*, No. 3369.

1897. Schaeberle, J. M., "Measures," *Ast. Journal*, vol. xvii. No. 394.

1897. Pritchett, H. S., "Observation," *Ast. Journal*, No. 399.

1897. Brenner, L., "Messungen," *Astr. Nachr.*, Bd. cxliii. No. 3421.

1897. Burnham, S. W., "The Orbit," *M. N. R. A. S.*, vol. lvii. pp. 453–456.

1897. Aitken, R. G., "Measures," *Ast. Journal*, vol. xviii. No. 415.

1897. See, T. J. J., "Remarks, etc.," *Ast. Journal*, vol. xviii. No. 418.

1897. Schaeberle, J. M., "Observations," *Ast. Journal*, vol. xviii. No. 420.

1897. Barnard, E. E., "Small Stars Near," *Ast. Journal*, vol. xviii. No. 420.

1898. Aitken, R. G., "Measures," *Ast. Journal*, vol. xviii. No. 424.

1898. See, T. J. J., "Measures," *Astr. Nachr.*, No. 3469.

No. 55. Innes 179. Lac. 2434. MAG. 6.9
$6^h\ 41^m\ 13^s$ — 30° 28′.9.

Comes = 10.2

1897.8	204°.8	5".40	See	1 n

Similar to the pair *h* 3891 S.f., but smaller. See No. 58.

No. 56. Innes 6. Lac. 2468. 7.0
$6^h\ 41^m\ 26^s$ — 61° 39′.3.

7.7 and 7.8

1896.2	250°.0	1".23	Sellors	3 n

Originally wrongly identified as Lac. 2487, a star 35′ N.f., as pointed out by Mr Sellors in the *Astr. Nachr.*, No. 3423.

No. 57. Innes 284. Bris. 1358. 8.5
$6^h\ 41^m\ 35^s$ — 64° 25′.4.

Comes = 11.0

1898.1	pr.	4".±	Innes	1 n

Several more distant *comites*.

[1] Gill and Elkin, Heliometer-Determinations of Stellar Parallax, etc. *Mem. R. A. S.*, Vol. xlviii., 1884. A new determination of the parallax of Sirius was made by Dr Gill in 1888–1889 with the 7-in. heliometer giving $\pi = 0''.370 \pm 0''.0097$. See *M.N.R.A.S.*, vol. lviii., 1898.

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No. 58. h. 3891. Piazzi 6 h. 238. MAG. 6.0
6h 41m 42s — 30° 50′.6.

Comes = 8.4

1838.0	222.0	5.02	*h*	3 n
1847.5	221.6	5.13	Jacob	1
1856.2	220.8	4.90	Secchi	1
1876.1	220.2	5.43	Cinc.	2
1897.8	[203.7]	5.49	See	1

Separately observed on the meridian at Cordoba.
See also No. 55.

No. 59. Innes 180. Cape 1880, 3201. 8.5
6h 42m 29s — 52° 19′.1.

9.0 and 9.5

1897.4	322.±	0.5±	Innes	2 n

Lac. 2471, mag. 6.2 orange, is 67 secs. f. and N.

No. 60. Ormond Stone. Ö.A. 5667. 8.6
6h 42m 45s — 20° 34′.1.

Comes = 10.0

1876.0	143.0	2.75	Cinc.	1 n

Separately observed on the meridian at Cordoba.
This pair may be Harvard 88.
In the C. G. A., the chief star is called red, but at Cinc. it was noted as blue. In the C. P. D. the combined mag. = 8.5.
Howe has measured two faint pairs N. f. this star. The star 12 Canis Majoris, mag. 6.0, is 20′ S.

No. 61. Σ 971. Schj. 2384. 8.3
6h 43m 45s — 13° 19′.7.

8.9 and 9.2

1829.9	331.0	1.85	Σ	3 n
1867.5	329.0	1.60	Dembowski	3
1881.1	327.5	1.62	Cinc.	2
1886.9	324.5	1.85	L. McC.	1

An 8.4 mag. star is closely S.f.

No. 62. β 20. Lal. 13,170. MAG. 7.8
6h 45m 19s — 16° 5′.8.

Comes = 10.7

1876.4	29.8	3.20	Dembowski	4–3 n
1878.1	30.7	2.90	Cinc.	1
1880.1	34.6	2.99	β	4
1886.1	30.1	3.70	L. McC.	1
1888.5	34.5	3.12	Haverford	3–1

N.f. Sirius.

No. 63. Alvan Clark 4. Lal. 13,173. 5.3
6h 44m 26s — 15° 1′.9.

5.5 and 7.0

1858.1	286.5	1.±	Jacob	2 n
1867.1	302.0	.....	Harvard	1
1877.6	297.1	0.98	Cinc.	2
1877.7	286.4	1.06	Dembowski	2
1878.0	292.2	1.01	β	2

No change.
Found in 1852 with a $4\frac{3}{4}$-inch refractor.

No. 64. Innes 157. Lac. 2484. 7.0
6h 44m 39s — 54° 35′.1.

Comes = 9.8

1897.2	10.±	2.±	Innes	1 n

No. 65. Innes 158. Lac. 2477. 7.2
6h 44m 44s — 48° 27′.2.

7.3 yellow, and 10.5 blue

1897.1	185.±	1.±	Innes	1 n

A 10th mag. star about 60″ S.f. and C. Z. 6 h. 2241, mag. 8.7, is 1m 20s f.

No. 66. β 324. Lac. 2462. 6.3
6h 45m 35s — 23° 57′.6.

6.5 and 8.5

1877.1	204.0	1.83	Cinc.	1 n
1889.0	203.3	1.71	Haverford	3–2
1892.9	199.0	1.74	,,	1
1894.1	208.3	2.±	Sellors	1

Ö.A. 5742, mag. 9.3, is 30″ pr. and with Lac. 2462 composes the old pair, South 537.
South 538 = Lac. 2461, a 27″ pair, is S.pr.

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No. 67. β 897. Lal. 13,198. MAG. 6.4
6h 45m 43s — 0° 25′.2.

Comes = 11.7

1879.1	30°.9	5″.60	β	3 n
1892.0	32.0	6.00	,,	3

Common p.m. of 0″.204 towards 180°.

No. 68. β 898a. B.D.—15°, 1532. 9.4
6h 45m 49s — 15° 54′.4.

9.9 and 10.4

1879.5	271°.7	1″.54	β	3 n
1892.0	270.3	1.91	,,	3

See also next star, No. 69.

No. 69. β 898b. Ö.A. 5753. 8.2
6h 45m 54s — 15° 54′.8.

Comes = 10.5

1879.7	356°.2	2″.95	β	5 n
1886.1	349.8	3.23	L. McC.	1
1892.0	357.5	3.23	β	3

β 898a, which see, is N. pr., and has been measured from β 898b as follows:—

1879.7	283°.1	96″.5	β	2 n
1892.0	282.1	96.8	,,	3

No. 70. Washburn 82. B.D. —11°, 1660. 9.1
6h 46m 12s — 11° 40′.5.

9.5 and 10.6

1888.4	222°.8	1″.70	Washburn	3 n

No. 71. Innes 181. C. Z. 6 h. 2289. 8.0
6h 46m 55s — 44° 56′.1.

8.5 and 9.0

1897.3	260°. ±	0″.6 ±	Innes	1 n

No. 72. Innes 182. Yarnall, 2843. 8.0
6h 47m 3s — 28° 35′.5.

8.4 and 9.2

1897.3	140°. ±	0″.8 ±	Innes	1 n

A wide double = Yarnall, 2845 and Yarnall, 2846, mags. 8.5 and 9.0, is closely S. f. = *h* 3896.

No. 73. Innes 159. Lac. 2491. MAG. 6.4 Orange
6h 47m 3s — 45° 19′.9.

Comes = 10.5

1897.2	315°. ±	4″.5 ±	Innes	2 n

C. P. D. mag. = 7.8.

Lac. 2489, mag. 7.0, is S.pr.

No. 74. β 325. Ö.A. 5814. 7.7
6h 47m 47s — 26° 27′.7.

8.1 and 9.1

1875.1	20°. ±	1″.6 ±	β	1 n
1877.1	35.7	1.92	Cinc.	1
1884.1	37.0	.....	,,	1
1897.8	37.2	1.81	See	1

Near a missing star, No. 46 of List I. p. (72) of vol. i. of the C. P. D.

No. 75 Cordoba [16]. C. Z. 6 h. 2396. 8.4
6h 48m 45s — 35° 10′.1.

9.0 and 9.3

1880.9	S.f.	4″	C. G. A.	3 n

No. 76. Cape 19. C. Z. 6 h. 2414. 9.0
6h 48m 50s — 47° 37′.8.

9.7 and 9.9

1898.1	120°. ±	1″.2 ±	Innes	1 n

Found by Mr W. H. Cox with the Transit-Circle.

No. 77. Σ 987. Lal. 13,341. 6.4
6h 49m 15s — 5° 43′.7.

7.1 and 7.2, both white

1831.5	163°.5	1″.13	Σ	3 n
1867.1	162.1	1.10	Dembowski	3
1878.0	164.8	1.29	Cinc.	1

The combined magnitude of this pair has been estimated as follows:—

Bessel = 9.0
Lal. and Σ = 7.0
Dembowski = 6.4 to 6.7
Radcliffe, 1890 = 6.7
Schönfeld = 6.4
Cincinnati = 5.3

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No. 78. h. 3900. Lac. 2520. MAG. 7.5
6h 50m 36s — 34° 5′.8.

Comes = 9.5

1838.1	285°.9	2″.±	*h*	1 n
1879.2	284.1	2.23	Hargrave	1
1887.2	281.0	2.26	Pollock	1
1897.2	282.3	2.46	See	2

Separately observed on the meridian at Cordoba.

No. 79. Σ 997. μ Canis Majoris. 5.2
6h 51m 32s — 13° 54′.8.

Comes = 8.9

1831.2	343°.5	3″.22	Σ	3 n
1844.2	340.8	3.13	Mädler	2
1857.1	337.8	2.76	Jacob	4
1869.1	338.1	2.88	Dembowski	4
1877.2	339.9	3.14	Cinc.	1
1887.2	339.8	2.88	Hall	5
1896.0	335.0	.....	Doberck	4

Other measures, but generally showing considerable discordance.

Small p.m.

Σ 990, two stars, 8.6 and 9.0 mags., 3″ apart, is 2m pr. 12′ S.

No. 80. Ormond Stone. Lac. 2526 7.3
6h 51m 47s — 25° 23′.4.

Comes = 10.0 bluish

1876.1	99°.4	3″.61	Cinc.	1 n
1877.1	97.5	3.76	,,	2

No. 81. Σ 998. W.B. 6 h. 1530. 9.1
6h 51m 56s — 5° 20′.9.

Comes = 9.4

1831.5	205°.5	3″.14	Σ	3 n
1867.1	209.5	3.05	Dembowski	3
1879.1	208.2	2.88	Cinc.	3
1886.8	207.7	3.43	L. McC.	1
1893.2	212.6	2.98	Glasenapp	2

Change doubtful.

No. 82. β 327. Lal. 13,492. MAG. 7.8
6h 53m 28s — 2° 53′.4.

8.5 and 8.7

1876.8	100°.8	0″.96	Dembowski	2 n
1878.1	97.2	1.1 ±	Cinc.	1
1881.0	96.1	0.75	β	1
1888.1	96.1	0.75	Haverford	2
1892.1	95.8	0.79	β	3

An 11.4 mag. star is 13″ S.f.

No. 83. Innes 65. Lac. 2546. 6.3
6h 53m 43s — 35° 22′.5.

6.5 and 8.0

1896.9	150°.±	0″.6 ±	Innes	1 n
1897.3	160.±	.....	,,	1
1898.3	190.3	0.26	See	1

Angle increasing?

In a group of four stars.

The limit of difficulty with the Cape Merz refractor of 6.9-inch aperture.

No. 84. Cape 7. ε Canis Majoris. 1.7
6h 54m 42s — 28° 50′.2.

Comes = 9.0

1850.1	160°.6	7″.48	Maclear	2–1
1878.2	160.2	7.42	β	1
1884.1	161.1	7.99	Cinc.	1
1897.0	160.9	7.85	See	2

The p.m. is small, about 0″.016 towards 263°, in which the *comes* seems to share.

C. P. D. mag. = 3.2. The star is, however, white or violetish.

The first double star found with the Merz refractor at the Cape. It has been registered as a new pair by several later observers.

No. 85. Innes 66. C. Z. 6 h. 2756. 7.7
6h 54m 42s — 35° 17′.0.

7.9 and 9.4

1897.1	255°.±	2″.±	Innes	2 n
1898.3	255.1	2.13	See	1

C. Z. 6 h. 2754, mag. 9.5, is about 15″ pr., making a neat triple star, the wide pair being *h* 3905, and showing no sign of change.

See also No. 83.

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No. 86. λ 73. Lac. 2558. MAG. 7.8
6h 55m 36s — 27° 45′.2.

8.5 and 8.6

1897.8	346°.1	0″.27	See	1 n

No. 87. β 572. Lal. 13,623. 7.5
6h 56m 16s — 20° 29′.9.

Comes = 11.2

1879.4	143°.9	5″.07	β	3 n
1892.1	142.6	5.27	,,	3
1897.8	143.5	5,92	See	1

Lal. 13,626, mag. 8.3, is closely S.f.

No. 88. Σ 1011. Lal. 13,616. 8.3
6h 56m 19s — 15° 10′.1.

8.8 and 9.3

1831.2	295°.7	4″.46	Σ	3 n
1868.9	298.5	4.25	Dembowski	4
1884.1	300.0	4.56	Cinc.	2
1898.3	298.7	4.39	See	1

Other measures.

No. 89. Innes 183. C. Z. 6 h. 2870. MAG. 7.5
6h 56m 42s — 25° 30′.2.

7.7 and 9.8

1897.3	.....	3″.±	Innes	1 n
1897.8	144°.4	3.34	See	1

No. 90. β 573. Lal. 13,642. 7.0
6h 57m 7s — 10° 44′.4.

7.6 and 8.0

1878.2	244°.9	0″.8 ±	Cinc.	2 n
1878.2	246.9	0.82	Dembowski	1
1879.1	248.6	0.75	β	1

No other measures found.

No. 91. h. 3932. Lac. 2689. 7.3
6h 58m 52s — 77° 38′.8.

Comes = 8.9 red

1835.6	278°.7	7″.±	*h*	2 n
1880.6	282.5	7.81	Hargrave	3

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No. 1. Dembowski 12. Lal. 13,776. MAG. 6.8
7h 1m 6s — 10° 30′.5.

Comes = 10.4

	°	″		
1867.2	278.7	6.12	Dembowski	2 n
1878.2	281.4	6.06	Cinc.	1
1881.1	281.9	6.14	β	1

A more distant *comes* and the chief star form the old pair Σ 1019.

No. 2. Dunlop 39. Lac. 2640. 5.9
7h 1m 43s — 59° 1′.7.

6.3 and 7.1

	°	″		
1835.0	73.5	2.79	*h*	2 n
1838.1	78.1	2.06	,,	1
1847.2	78.4	2.67	Jacob	1
1850.6	76.1	2.69	,,	2–1
1877.7	78.0	2.34	Sydney	2
1887.1	85.1	2.38	Tebbutt	1
1893.2	78.6	1.74	Sellors	1

Probably fixed.

The measures made at Hongkong in 1896 (see *Astr. Nach.*, No. 3378), evidently refer to another pair.

The companion is Cape 1840, 808.

No. 3. h. 3928. Lac. 2612. 6.6
7h 1m 54s — 34° 37′.5.

6.9 and 8.0

	°	″		
1836.6	157.7	5.39	*h*	3 n
1848.1	159.7	4.77	Jacob	1
1877.1	158.3	3.98	Cinc.	1
1879.2	156.3	3.25	Hargrave	1
1879.3	156.6	4.40	Melbourne	1
1891.2	154.1	3.46	Sellors	1
1896.0	154.6	3.96	Doberck	2
1897.2	154.8	4.20	See	2

Separately observed on the meridian at Cordoba.

Jacob and others measure a star 36″ preceding = C. Z. 7 h. 68, mag. 9.5.

No. 4. β 328. Lal. 13,811. MAG. 5.1
7h 1m 59s — 11° 8′.4.

5.3 and 7.0

	°	″		
1875.9	128.4	0.3 ±	Dembowski	4 n
1878.2	127.8	0.52 ±	Cinc.	2
1879.1	117.8	0.48	β	1
1880.4	122.3	0.51 ±	Schiaparelli	4
1887.2	116.1	0.42	,,	2
1892.1	118.0	0.51	β	4

A 9.8 mag. star 17½″ N.pr. makes with the close pair the old pair Σ 1026 rej.

No. 5. β 574. Lal. 13,821. 8.4
7h 2m 15s — 11° 10′.2.

8.5 and 11.8

	°	″		
1878.0	306.7	1.76	β	1 n
1892.0	311.3	2.26	,,	3

Near β 328.

No. 6. Σ 1029. Lal. 13,837. 7.8.
7h 3m 0s — 4° 31′.2.

8.3 and 9.0

	°	″		
1833.7	23.4	2.08	Σ	4 n
1865.7	25.8	1.91	Dembowski	2
1878.1	25.2	1.92	Cinc.	2

No. 7. Σ 1031. W.B. 7 h. 22. 8.3
7h 4m 0s — 13° 49′.6.

8.8 and 9.5

	°	″		
1831.2	251.6	3.80	Σ	3 n
1867.5	248.2	3.74	Dembowski	3
1879.5	248.9	3.51	β	3–2
1885.1	247.3	3.68	Cinc.	1

h noted a 12th mag. star 12″ N., measured by β.

No. 8. Σ 1034. W.B. 7 h. 37. 8.4
7h 4m 34s — 8° 8′.5.

8.9 and 9.4

	°	″		
1830.5	17.6	2.46	Σ	3 n
1868.2	16.8	2.29	Dembowski	3
1878.1	18.7	2.64	β	1

Fixed.

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No. 9. Σ 1043. W.B. 7 h. 140. MAG. 9.0
7h 7m 32s — 0° 30′.7.

9.7 and 9.9

	°	″		
1831.9	248.3	2.39	Σ	3 n
1868.5	246.6	2.37	Dembowski	3
1879.2	245.9	2.45	Cinc.	1
1888.1	245.3	2.51	Haverford	1

W. B. 7 h, 138, mag. 9.0, is closely N.pr.

No. 10. Innes 184. Bris. 1505. 8.0
7h 7m 46s — 60° 24′.8.

8.4 and 9.4

	°	″		
1897.7	180. ±	0.7 ±	Innes	2 n

Another double star, *h* 3941, is 12′ N.f.

A measure made by Mr Hargrave in 1883 purporting to be of Bris. 1505 is given in the second *Sydney Catalogue of Double Star Measures.* It agrees, however, so well in angle and distance with *h* 3941, that it has been transferred to that star.

See :—

1897. *Journal Brit. Astr. Assoc.*, vol. vii. p. 457.

No. 11. Hargrave 9. Bris. 1503. 7.5
7h 7m 53s — 56° 12′.4.

8.0 and 8.7

	°	″		
1883.2	170. ±	1.5 ±	Hargrave	1 n
1894.2	219.8	1. ±	Sellors	1

Considerable difference shown.

Preceded by a 50″ pair, each about 8th mag., = Lac. 2680 and Bris. 1510.

No. 12. β 197. Lal. 14,026. 7.9
7h 7m 58s — 6° 58′.9.

8.1 and 9.6

	°	″		
1874.1	150.6	2. ±	β	1 n
1876.9	147.0	2.28	Dembowski	2
1879.2	149.4	1.87	Cinc.	1
1886.9	144.8	2.21	L. McC.	1
1888.1	147.8	2.17	Haverford	3

No. 13. h. 3941. Lac. 2692. MAG. 6.9
7h 8m 2s — 60° 13′.0.

7.1 and 8.5 yellow

	°	″		
1837.1	310.4	0.81	*h*	3 n
1878.2	293.9	1.36	Russell	1
1880.2	307.2	0.72	Hargrave	1
1883.3	304.9	1.01	„	1
1888.1	301.0	0.8 ±	Pollock	1

Probably unchanged.

The mag. of the chief star has been estimated as follows :—

h = 8.7
Russell = 9.0
Pollock = 7.0

The measure of 1883.3 in the second *Sydney Catalogue* is put as being of Bris. 1505, a double star 12′ S.pr. See No. 10.

No. 14. β 757. Lac. 2668. 6.3
7h 8m 53s — 36° 22′.5.

6.5 and 8.1

	°	″		
1881.2	65.8	2.25	Pritchett	1 n
1887.2	67.7	2.57	Pollock	1
1893.2	62.6	2.66	Sellors	2
1897.2	69.2	3.06	See	2

Found in 1879.

Pritchett also measures a star 3m.8 f. in R.A., same Dec., distance 2″.57.

No. 15. Σ 1049. W.B. 7 h. 197. 7.8
7h 8m 54s — 8° 44′.8.

8.2 and 9.3

	°	″		
1830.5	34.9	3.63	Σ	3 n
1867.7	42.7	3.50	Dembowski	3
1880.1	42.9	3.61	β	1
1886.1	42.8	3.79	Cinc.	1

No. 16. Dunlop 42. γ Volantis. 3.8
7h 9m 36s — 70° 20′.2.

Bris. 1529 = 5.7

	°	″		
1836.4	301.3	12.8	*h*	4 n
1879.7	299.8	13.4	Hargrave	2
1888.3	299.7	13.3	Tebbutt	1

Miscalled *h* 3945 in the first Sydney Observatory list of double stars.

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No. 17. β 575. Ö.A. 6449. MAG. 7.5
$7^h\ 10^m\ 15^s$ — 15° 18′.0.

8.2 and 8.3

1878.2	195°.3	0″.49 ±	Cinc.	2 n
1878.2	199.2	0.69	β	2
1889.2	199.9	0.70	Haverford	1
1898.3	220.7	0.34	See	1

A 9.8 mag. star 16″ N. with the above pair = Σ 1057.

No. 18. Hough 344. Ö.A. 6460. 8.2
$7^h\ 10^m\ 30^s$ — 20° 51′.1.

8.9 and 9.1

1890.2	359°.5	0″.86	Hough	3–2 n

The S. star of a small triangle.

No. 19. Σ 1056. Lal. 14,107. 8.0
$7^h\ 10^m\ 31^s$ — 1° 41′.1.

8.4 and 9.4

1830.5	297°.9	3″.97	Σ	3 n
1868.4	298.2	3.79	Dembowski	3
1886.1	300.7	3.90	L. McC.	1
1893.1	299.0	3.55	Glasenapp	2

No. 20. Howe. W.B. 7 h. 245 9.0
$7^h\ 10^m\ 40^s$ — 0° 27′.0.

9.7 and 9.8

1879.2	314°.7	2″.49	Cinc.	1 n
1886.7	313.1	2.66	L. McC.	2
1892.1	314.7	2.78	Haverford	2

No. 21. Sellors 22. C. Z. 7 h. 719. 9.5
$7^h\ 11^m\ 18^s$ — 44° 29′.2.

9.8 and 11.0

1896.2	266°.0	1″.66	Sellors	3 n

C. Z. 7 h. 723, mag. 9.0, is 15″ N.f.

No. 22. Lalande. Lal. 14,200. MAG. 4.9 Orange.
$7^h\ 12^m\ 24^s$ — 23° 8′.2.

Lal. 14,202 = 6.6 blue

1837.2	67°.6	28″.21	*h*	2 n

A fine object.
Combined mag. in C. P. D. = 6.8.
A 10.3 mag. star 2′ S.

No. 23. β 330. Göttingen 2446. 8.7
$7^h\ 14^m\ 27^s$ — 0° 43′.4.

9.1 and 10.2

1876.9	218°.0	1″.28	Dembowski	2 n
1878.1	214.7	1.17	Cinc.	1
1882.2	214.2	1.3 ±	Schiaparelli	3
1886.8	213.5	1.25	L. McC.	1
1888.4	215.6	1.23	Haverford	2

No. 24. h. 3948. τ Canis Majoris. 4.6
$7^h\ 14^m\ 34^s$ — 24° 46′.3.

Companion = 9.8

1835.0	86°.0	8″. ±	*h*	1 n
1876.0	89.5	8.91	Cinc.	1
1877.6	89.4	8.68	,,	2
1880.2	90.0	7.84	β	2

β sees twenty or more stars in the field—the nearest 14″ f. of the 10.9 mag. Also noted by *h* and the Cordoba observers.

Small common p.m.

τ Canis Majoris is the central star of a pretty cluster = H VII. 17.

No. 25. Innes 7. Lac. 2740. 7.3
$7^h\ 14^m\ 37^s$ — 46° 48′.9.

7.5 and 9.7, both orange-yellow

1896.2	214°.9	1″.34	Sellors	3 n
1897.1	212.6	0.69	See	5

Common p.m. of 0″.612 towards 336°.2.

The fourth star of five in a sickle.

Lac. 2710, mag. 5.8, about 3^m pr. and 8′ N., has been noted as double (see *Harvard Circular*, No. 18), but was single as viewed with the Cape 7-inch refractor on 1898.0.

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No. 26. h. 3949. Lac. 2729. MAG. 7.3
7h 14m 41s — 30° 36′.9.

7.9 and 8.2

1837.0	74°.6	3″.20	*h*	3 n
1848.1	77.6	3.35	Jacob	1
1876.2	76.3	3.37	Cinc.	4
1896.0	76.9	.....	Doberck	2

Separately observed on the meridian at Cordoba.

No. 27. Jacob [4]. C. Z. 7 h. 989. 9.1
7h 14m 59s — 36° 35′.1.

9.8 and 10.0

1846.2	211°.5	3″.±	Jacob	1 n
1851.2	213.0	2.98	,,	2–1
1884.1	208.4	3.18	Cinc.	1
1897.1	209.4	2.86	Lowell	3

The combined mag. 9.1 (from the Cor. D.M.) is about 0.5 too faint.

This neat little pair is near the naked eye pair *v* Puppis (mags. 4.8 and 5.3) N.f. *π* Argûs, mag. 2.7 orange-red (mag. in C. P. D. = 6.3).

No. 28. Lalande 53. Lal. 14,292. 7.6
7h 15m 4s — 21° 51′.8.

8.3 and 8.4

1837.1	348°.3+	3″.±	*h*	1 n
1851.2	346.6	4.04	Jacob	2
1876.2	345.8+	4.06	Cinc.	1
1877.1	347.0	3.92	,,	2

Also registered as *h* 3950.

An 8.7 mag. star 10 secs. f. 2′ N. is noted as double in the C. P. D.

No. 29. β 331. C. Z. 7 h. 1032. 8.5
7h 15m 53s — 24° 13′.9.

8.9 and 9.8

1877.1	115°.6	2″.00	Cinc.	1 n
1889.1	114.7	1.93	Haverford	2–1
1894.1	115.4	1.75	Sellors	1

No. 30. λ 76. Lac. 2747. 6.7
7h 16m 51s — 26° 46′.6.

Comes = 14.0

1897.1	216°.4	7″.95	See	2 n

No. 31. Sellors 23. C. Z. 7 h. 1186. MAG. 8.7
7h 17m 46s — 43° 38′.2.

9.0 and 10.1

1896.2	157°.0	2″.23	Sellors	3 n

No. 32. Rumker 6. Lac. 2779. 6.8 Yellow.
7h 17m 57s — 52° 7′.7.

Taylor 3019 = 7.0 yellow

1835.0	16°.1	10″.5	*h*	2 n
1847.1	16.8	10.0	Jacob	2
1883.3	18.2	9.5	Hargrave	1
1896.0	19.9	9.3	Doberck	2
1897.0	20.3	9.4	See	2

The third measure quoted is taken from the Sydney Observatory lists, wherein the pair is called *h* 3958 erroneously.

A coarse pair about 12′ N.

No. 33. h. 3956. Bris. 1576. 8.5
7h 18m 6s — 48° 19′.5.

Companion = 9.3

1836.3	163°.9	8″.77	*h*	3 n
1848.1	164.3	6.62	Jacob	1
1881.3	163.5	7.31	Hargrave	1

h 3960, a wide pair, is closely S.f.

Both pairs have had all components observed on the meridian at Cordoba.

No. 34. Hough. Brux. 3080. 8.8
7h 18m 18s — 21° 0′.2.

9.0 and 10.5

1890.1	f.	0″.6 ±	Hough	1 n

Another double star closely N.f. See No. 36.

No. 35. λ 77. C. Z. 7 h. 1222. 8.5
7h 18m 19s — 36° 26′.2.

8.8 and 10.0

1897.2	302°.0	0″.40	See	1 n

In a triangle with C. Z. 7 h. 1212, mag. 9.6, and C. Z. 7 h. 1227, mag. 8.0.

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No. 36. Hough. B.D.—20°, 1893. MAG. 9.4
7h 18m 22s — 20° 58′.3.

Both = 10.2

1890.1	40.° ±	1.″5 ±	Hough	1 n

See also No. 34.

No. 37. h. 3957. Lac. 2767. 7.7.
7h 18m 40s — 35° 43′.6.

Cape 1880, 3608 = 8.6

1836.6	196.°8	15.″ ±	*h*	2 n
1877.1	194.9	8.16	Cinc.	1
1881.2	194.5	6.97	Hargrave	2
1896.0	195.3	.....	Doberck	2

No. 38. λ 78. Ö.A. (6740). 7.7 Red
7h 18m 51s — 25° 34′.5.

B = 12.8 C = 12.0 D = 12.4

A and B

1897.8	288.°4	2.″34	See	1 n

A and C

1897.8	13.°6	2.″98	See	1 n

A and D

1897.8	29.°9	6.″86	See	1 n

C. P. D. mag. = 8.8.

No. 39. Σ 1085. W.B. 7 h. 515. 8.8
7h 19m 31s — 4° 24′.8.

9.0 and 10.7

1830.7	278.°3	3.″19	Σ	4 n
1867.5	280.3	3.21	Dembowski	3

No. 40. β 199. Lal. 14,480. 7.3
7h 20m 49s — 20° 58′.6.

7.7 and 8.7

1870.2	19.°4	1.″72	Harvard	1 n
1877.2	22.2	1.84	Cinc.	2
1892.1	23.2	1.63	Haverford	1
1893.2	23.2	1.74	Sellors	2
1896.0	24.7	.....	Doberck	3

This pair is also = Harvard 104.

A wide faint pair = *h* 3964 is to the N., and another wide pair = β 198 (Lal. 14503) is N.f.

No. 41. h 3966. Lac. 2801. MAG. 7.4
7h 21m 15s — 37° 5′.7.

Cape 1880, 3640 = 7.5

1836.0	140.°9	7.″03	*h*	2 n
1851.1	142.6*	7.15	Jacob	2
1893.1	140.0	7.16	Scott	1
1896.0	144.0*	7.06	Doberck	2
1897.2	141.8	6.96	See	2

A 9.5 mag. star = C. Z. 7 h. 1451 is 5′ S.f.

No. 42. λ—. Ö.A. 6790. 7.7
7h 21m 16s — 27° 59′.3.

8.3 and 8.7

1897.8	290.°4	0.″64	See	1 n

C. G. A. 9515, mag. 10.2, is closely S.pr.

Prof. See credits the close pair to Cordoba. It would, however, seem to be due to Prof. See himself.

See also No. 44.

No. 43. Ormond Stone. Lal. 14,506. 8.0
7h 21m 41s — 18° 9′.7.

Companion = 9.5

1877.0	77.°8	4.″61	Dembowski	2 n
1877.1	76.7	4.80	Cinc.	2
1885.6	76.1	4.80	,,	2

No. 44. λ 79. Ö.A. 6819. 8.2
7h 22m 16s — 27° 57′.7.

8.8 and 9.2

1897.9	296.°7	0.″36	See	1 n

See also No. 42, which is 1m pr.

No. 45. β 578. Lal. 14,545. 5.6
7h 22m 41s — 17° 39′.8.

Comes = 10.5

1878.2	53.°6	1.″72	β	1 n
1878.2	50.6	2.51	Dembowski	1
1878.2	52.4	.....	Cinc.	1
1886.2	48.8	2.33	,,	2

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No. 46. β 332. Piazzi 7 h. 116. MAG. 5.8
7h 23m 10s — 11° 21′.2.

6.0 yellow, and 7.8

1875.5	166°.3	0″.80	Dembowski	3 n
1878.2	170.2	0.87	Cinc.	2
1887.2	165·8	0.89	Tarrant	6
1892.0	168.7	0.85	β	3

The chief star of the old 20″ pair Σ 1097. There are three more distant stars (20″ to 32″), but none shows signs of change.

Also called U Puppis, and considered variable by some observers from 6.0 to 6.8 in a period of fourteen days. It is, however, not included in Chandler's third *Catalogue of Variable Stars.*

No. 47. Σ 1104. Lal. 14,619. 6.8
7h 24m 49s — 14° 47′.1.

7.0 and 8.8

1834.9	292°.4	2″.35	Σ	3 n
1864.5	312.3	2.21	Dembowski	3
1874.2	314.0	2.55	Temple Obsy.	1
1878.4	318.3	2.29	Cinc.	8
1880.2	321.0	2.60	Pritchett	4
1893.2	326.3	2.54	Glasenapp	2
1893.2	328.5	2.24	Lewis	2

Common p.m. of 0″.307 towards 221°.4.
A binary system.

No. 48. Dunlop 51. σ Argûs. 3.1 Yellow
7h 26m 3s — 43° 6′.0.

Companion = 7.9 blue

1836.0	75°.0	22″.5	*h*	2 n
1847.1	73.0	22.6	Jacob	1
1879.3	74.4	22.1	Hargrave	1
1897.2	73.2	22.4	See	2

Common p.m. of 0″.217 towards 326°.2.
C. P. D. mag. = 6.5.

No. 49. λ 80. Lac. 2833. 7.8
7h 26m 45s — 27° 53′.1.

8.5 and 8.7

1897.8	86°.1	0″.25	See	1 n

Ö.A. 6949, mag. 8.1, is 88″ S.f.

No. 50. h. 3974. Bris. 1641. MAG. 8.3
7h 27m 22s — 55° 5′.7.

8.5 and 10.1

1836.1	241°.9	3″.±	*h*	2 n
1872.2	241.6	5.49	Russell	1

Fixed.
There is an error in this observation as printed in the *Mem. R. A. S.*, vol. xlvii.

No. 51. h. 3996. Lac. 3096. 7.6
7h 27m 48s — 84° 16′.8.

Comes = 12.0

1836.0	248°.4	13″.±	*h*	2 n

No. 52. Howe 7. Ö.A. 7035. 8.6
7h 29m 48s — 23° 29′.1.

9.0 and 10.0

1877.2	203°.3	1″.86	Cinc.	2 n
1885.1	203.8	1.79	,,	1

No. 53. ♅. N. 19. n Puppis. 5.2
7h 30m 5s — 23° 15′.3.

5.9 and 6.1

1846.2	106°.8	9″.16	Jacob	1 n
1853.2	108.0	8.68	,,	2
1868.2	107.4*	9.37	Harvard	1
1876.1	108.4	9.59	Cinc.	4
1885.1	109.6	8.96	,,	1
1897.8	108.6	9.37	See	1

Also registered as Dunlop 52 and South 552.
No. 52 is a little S.pr.

No. 54. Cordoba [70]. Lal. 14,834. 7.0
7h 31m 3s — 2° 56′.1.

7.4 and 8.3

1879.1	241°.6	5″.6	C. G. A.	1 n

The p.m. of the chief star is 0″.337 towards 290°.9.
Seen in 1898, considerable change shown.

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No. 55. Cordoba [71]. Bris. 1669. MAG. 7.7
7h 31m 6s — 66° 58′.1.

Comes = 10.5

1880.2	190°.9	5″.60	C.G.A.	1 n

No. 56. ℍ. II. 63. Lal. 14,885. 7.5
7h 32m 0s — 14° 15′.7.

Lal. 14,884 = 7.7

1831.4	304°.7	7″.45	Σ	4 n
1851.2	303.5	7.09	Jacob	2
1867.5	305.0	7.40	Dembowski	3
1893.2	304.3	7.03	Glasenapp	2

Also called Σ 1121.
Fixed.
Other measures.

No. 57. Hough 35. Göttingen 2582. 8.8
7h 32m 26s — 0° 45′.9.

9.2 and 10.2

1882.2	222°.3	0″.88	Hough	1 n

No. 58. Argelander [2]. Lal. 14,945. 8.2
7h 34m 35s — 20° 2′.7.

Companion = 8.9

1876.2	329°.6	3″.11	Cinc.	3 n
1876.4	330.6	2.89	Dembowski	3
1882.1	330.6	3.43	Cinc.	2–1
1886.2	331.0	2.80	L. McC.	1
1889.0	331.1	2.84	Haverford	3

Discovered by Argelander on 10th Feb. 1851; also registered as β 201.

No. 59. Triple. k Puppis. 3.9
7h 34m 44s — 26° 34′.4.

A = 4.6 B = 4.8 C = 13.7

A and B = ℍ. III. 27

1853.2	319°.1	9″.71	Jacob	2 n
1878.2	318.5	9.94	Cinc.	1
1889.1	318.5	9.98	β	3

Other measures.
Also registered as Dunlop 53.

B and C = β 1061

1889.1	229°.3	6″.46	β	3 n

Erroneously called κ Argûs by β.

No. 60. Innes 285. C. Z. 7 h. 2481. MAG. 8.8
7h 35m 32s —48° 26′.5.

9.4 and 9.8

1898.3	140°. ±	1″. ±	Innes	1 n

About 4′ S. of Lac. 2918, mag. 5.6.

No. 61. λ 84. Lal. 14,980. 6.4
7h 35m 50s — 19° 25′.8.

Comes = 11.0

1897.8	287°.4	9″.27	See	1 n

C. P. D. mag. = 7.7.

No. 62. Innes 160. d_2 Puppis. 5.9
7h 36m 12s — 37° 54′.5.

6.0 and 8.7

1897.2	155°. ±	1″.1 ±	Innes	3 n

The most northern of a group of three bright stars.

No. 63. Innes 185. Cor. D.M.— 29°, 4757. 9.5
7h 36m 42s — 29° 52′.7.

10.0 and 10.5

1897.3	190°. ±	2″. ±	Innes	1 n

Closely S.f. a group of stars, the two brightest of which are Lac. 2908, mag. 7.8, and Ö.A. 7237, mag. 8.1.

No. 64. Washburn 91. Ö.A. 7245. 8.6
7h 36m 53s — 20° 6′.0.

8.8 and 11.0

1888.5	214°.5	1″.88	Washburn	3 n

A 9.0 mag. star 2′ S.

No. 65. h. 3997. Lac. 3010. 6.1
7h 37m 25s — 74° 2′.9.

6.8 and 6.9 both yellow

1836.6	100°.8	1″.75	h	2 n
1875.7	105.6	2.09	Sydney	2

Separately observed on the meridian at Cordoba.

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No. 66. Σ 1133. W.B. 7 h. 1084. MAG. 8.6
7h 37m 36s — 3° 47′.2.

Comes = 9.8

1831.2	108°.3	4″.35	Σ	3 n
1866.9	107.7	4.26	Dembowski	4–3
1879.1	108.0	4.08	Cinc.	2

No. 67. h. 4000. Lac. 2982. 7.5
7h 40m 31s — 58° 25′.9.

Comes = 11.2

1836.5	232°.6	1″.8 ±	*h*	2 n
1895.2	235.5	1.45	Sellors	3

Also seen at Sydney in 1873 and 1880.
A difficult pair for a reflecting telescope.
Lac. 2979, mag. 6.5, about 3′ N., seems to share in the small p.m. of *h* 4000.

No. 68. ♅. IV. 91. 2 Puppis. 6.5
7h 40m 53s — 14° 26′.8.

7.1 and 7.4

1783.1	339°.2	[17″.4]	♅	1 n
1829.6	339.2	16.5	Σ	3
1868.7	338.8	16.8	Dembowski	4
1876.1	340.2	17.9	Howe	1

Also known as Σ 1138.
Small common p.m.

No. 69. Dunlop 57. ζ Volantis. 3.8 Yellow
7h 43m 3s — 72° 22′.0.

Comes = 9.5 blue

1835.9	115°.7	19″. ±	*h*	4 n
1876.2	114.8	17.0	Sydney	2

The chief star has a p.m. of 0″.014 towards 90°.
Erroneously called *h* 4009 by Mr Russell.

No. 70. Σ 1146. 5 Puppis. MAG. 5.4
7h 43m 16s — 11° 56′.8.

5.6 yellow, and 8.2 blue

1827.2	17°.4	3″.33	Σ	2 n
1832.5	17.3	3.25	„	4
1858.9	17.1	3.34	Morton	1
1878.1	14.9	3.30	Cinc.	1
1887.2	15.4	3.25	Hall	3
1893.2	13.4	3.18	Glasenapp	2

Common p.m. of 0″.148 towards 302°.8.
Estimates of the mag. of A. vary from 5.3 to 7.5, and of B. from 7.4 to 9.0.
Other measures.

No. 71. Innes 161. Piazzi 7 h. 225. 5.3
7h 43m 53s — 38° 15′.8.

Comes = 10.5

1897.1	90°. ±	10″. ±	Innes	1 n
1897.2	86.0	11.0	See	1

Also noted at Arequipa, see *Harvard Circular*, No. 18, 29th July 1897.

No. 72. Cape 20. C. Z. 7 h. 3229. 8.5
7h 44m 50s — 44° 17′.7.

Comes = 9.5

1898.1	90°. ±	2″.5 ±	Innes	1 n

Discovered by Mr J. A. J. Pead at the transit circle.

No. 73. Hough 37. Göttingen 2666. 9.0
7h 44m 55s — 2° 1′.2.

9.7 and 9.8

1882.2	177°.3	1″.50	Hough	1 n
1888.8	175.2	1.60	Haverford	3–2
1889.2	176.6	1.18	Hough	3

No. 74. β 1063. ξ Argûs. 3.4
7h 45m 5s — 24° 36′.5.

Comes = 13.7

1889.1	188°.7	4″.63	β	3 n
1898.3	223.7	5.44	See	1

ξ Argûs is a red star, and may be a "variable," as the estimates of its mag. vary from 2.7 to 3.8. Its C. P. D. mag. = 6.4; and its p.m. = 0″.027 towards 306°.3.

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No. 75. λ 87. Lal. 15,304. MAG. 6.9
7h 45m 22s — 19° 57′.0.

Comes = 14.8

1897.8	144°.5	4″.47	See	1 n

No. 76. Innes 186. Ö.A. 7505. 7.4
7h 45m 27s — 30° 18′.3.

8.0 and 8.3

1897.4	200°. ±	1″.2 ±	Innes	1 n

The chief star of four forming a diamond in the finder, the most N. component being Ö.A. 7473, mag. 7.5.

No. 77. Harvard 110. Ö.A. 7528. 9.1
7h 46m 33s — 23° 55′.6.

9.3 and 11.3

1869.1	S.pr.	2″. ±	Harvard	1 n

Harvard 109, a "suspected" pair, is 55′ N.pr.

No. 78. β 1195. Lal. 15331. 7.2
7h 46m 33s — 9° 9′.0.

7.8 and 8.1

1891.00	81°.4	0″.46	β	3 n

A small common p.m. probable.

No. 79. λ 88. Lac. 3046. 5.6
7h 46m 58s — 56° 9′.5.

Comes = 13.8

1897.1	185°.1	5″.76	See	3 n

No. 80. Σ 1154. Lal. 15,342. 6.7
7h 47m 7s — 2° 47′.9.

6.9 and 9.1

1827.7	357°.9	2″.26	Σ	4 n
1868.1	356.4	2.04	Dembowski	3
1878.2	352.9	2.41	β	1

A wider pair, Σ 1152, is 69 secs. pr. 2′ N.

No. 81. β 101. 9 Puppis. MAG. 5.5
7h 47m 8s — 13° 37′.9.

6.0 and 6.6

1875.7	289°.4	0″.46	Dembowski	3 n
1883.1	336.2	0.3 ±	β	1
1892.0	98.7	0.22	„	3
1897.4	291.9	0.66	Doolittle	4

Common p.m. = 0″.36 towards 180°.
One of the shortest period binaries known.
Prof. See finds:—

P = 22.0 years.
T = 1892.3
a = 0″.65
e = 0.70 *i* = 77°.7
Ω = 95°.5 λ = 75.3

Papers:—
1873. Burnham, S. W., *Astron. Register.*
1876. Burnham, S. W., *Astron. Register.*
1892. Glasenapp, S., "Orbit," *M. N. R. A. S.*, vol. lii. pp. 546–547.
1894. Glasenapp, S., "Orbit," *M. N. R. A. S.*, vol. liv. pp. 318–319.

No. 82. Cordoba [17]. Bris. 1795. 7.2
7h 47m 21s — 54° 49′.4.

7.4 and 9.1

1876.2	51°.9	4″.85	C. G. A.	3 n
1897.1	55.1	3.85	See	2

No. 83. Howe 8. Piazzi 7 h. 250. 5.0
7h 48m 32s — 34° 27′.3.

5.1 and 8.1

1877.2	292°.0	2″.64	Cinc.	1 n
1897.0	280.7	3.12	See	3

Common p.m. of 0″.305 towards 316°.2.
Considerable change shown.
C. P. D. mag. = 6.4.
Registered as a new pair discovered at Arequipa in 1891, in *Harvard Circular*, No. 18.

No. 84. λ 89. *b* Puppis. 4.7
7h 49m 6s — 38° 36′.2.

Comes = 11.2

1897.1	81°.5	11″.06	See	2 n

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No. 85. Σ 1157. Piazzi 7 h. 247. MAG. 7.2
7h 49m 31s — 2° 32′.0.

7.9 and 8.0

1831.2	267°.2	1″.59	Σ	3 n
1857.9	254.3	1.23 ±	Dembowski	3
1868.7	254.4	1.24	„	2
1878.7	250.9	1.24	Cinc.	4
1887.6	247.0	1.28	Tarrant	3
1893.2	246.2	1.16	Maw	3

Other measures.

No. 86. Innes 286. C.P.D.—47°, 1638. 8.6
7h 49m 46s — 47° 43′.4.

Both = 9.4

1898.3	320°. ±	2″. ±	Innes	1 n

The most N. of three stars N.pr. J Puppis, 4.3 mag.

No. 87. h. 4018. Bris. 1816. 7.7
7h 50m 27s — 59° 21′.2.

Companion = 9.1

1838.1	321°.9	6″.06	*h*	1 n
1880.4	327.3	4.62	Hargrave	1

Separately observed on the meridian at Cordoba. A 10th mag. star about 1′ away.

No. 88. h. 4023. Lac. 3111. 7.5
7h 51m 17s — 70° 31′.2.

8.1 and 8.4

1836.1	229°.6	1″. ±	*h*	2 n

No other measure found, but the pair was "seen" by Mr Russell in 1873, who, with *h*, calls the chief star = 9.0.

No. 89. λ 91. Piazzi 7 h. 274. 6.7
7h 52m 32s — 43° 34′.7.

7.4 and 7.5

1897.2	302°.4	0″.39	See	1 n

Gilliss 642, mag. 7.5, is N.pr., and has a faint *comes* at 5″.4, seen at Cordoba in 1876, and measured by Prof. See.

No. 90. Innes 162. Lac. 3088. MAG. 7.5
7h 52m 43s — 52° 38′.3.

7.6 and 11.0

1897.0	190°. ±	1″. ±	Innes	1 n

No. 91. β 902. Lal. 15,575. 8.0
7h 53m 19s — 10° 36′.8.

8.1 and 10.7

1879.2	247°.1	1″.33	β	1 n
1879.3	245.5	1.16	Cinc.	1
1882.1	248.7	1.68	„	1
1892.2	243.7	1.17	Haverford	2–1

No. 92. Triple. N Puppis. 5.2
7h 54m 4s — 43° 50′.5.

A and B = 12.6 = Harvard

1897.1	35°.8	9″.80	See	2 n

A and C = 13.1 = λ 92

1897.2	87°.5	22″.9	See	1 n

No. 93. Innes 26. Lac. 3094. 6.7
7h 54m 22s — 47° 37′.3.

7.1 and 8.1

1895.3	27°.5	0″.8 ±	Tebbutt	1 n
1896.2	31.4	1.15	Sellors	3
1897.2	26.8	0.68	See	1

The very few determinations of the position of this star which exist indicate a considerable p.m.

No. 94. Washburn 93. B.D.—10°, 2319. 8.8
7h 54m 38s — 10° 12′.4.

9.2 and 10.2

1888.9	187°.4	1″.00	Washburn	3 n

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No. 95. Washburn 94. Lal. 15,649. MAG. **8.5**
7h 55m 8s — 13° 34′.6.

8.6 and 11.0

1888.8	279°.3	3″.10	Washburn	3 n
1890.2	281.0	1.82	Hough	2

W. B. 7 h. 1585, mag. 8.9, is 27 secs. f.

No. 96. Innes 29. C. Z. 7 h. 4122. 8.0
7h 55m 15s — 60° 19′.7.

8.4 and 9.4

1895.4	N.	1″. ±	Innes	1 n

About 5′ S. of Lac. 3113, mag. 6.3.
A similar but wider pair is about 3′ S.f.

No. 97. Triple. Lac. 3105. 4.5
7h 55m 22s — 48° 58′.4.

A = 4.5 B = 10.4 C = 10.6

A and B = Hargrave

1880.4	69°.9	5″.32	Hargrave	1 n
1897.1	72.2	6.85	See	3

A and C = *h* 4025

1836.1	48°.2	18″. ±	*h*	1 n
1897.1	49.9	18.69	See	2

Another star, mag. 9.0, 40°; 39″, seems unchanged.
Prof. See measures a star 11″ from it, his λ 93.

No. 98. Innes 30. Cape 1880, 4038. 8.0
7h 55m 51s — 47° 24′.6.

8.2 and 10.2

1896.2	347°.5	1″.83	Sellors	3 n
1897.2	343.4	1.30	See	1

Originally wrongly identified as Bris. 1851, which is S.f.
Also registered as λ 94.

No. 99. β 333. Lal. 15,720. MAG. **7.7**
7h 56m 59s — 22° 3′.6.

7.9 and 9.6

1877.2	46°.6	1″.90	Cinc.	1 n
1879.1	45.4	1.44	„	2
1886.2	42.7	1.70	„	1
1893.2	39.4	1.45	Sellors	2
1897.8	45.8	2.02	See	1

Lal. 15,721, mag. 8.4, orange, is 42″ N.f.
Prof. See points out that this pair had previously been wrongly identified.

No. 100. Innes 163. C. Z. 7 h. 4294. 8.2
7h 57m 29s — 40° 17′.6.

8.5 and 10.0

1897.1	130°. ±	0″.9 ±	Innes	1 n

C. Z. 7 h. 4283, mag. 8.0, orange, is 7 secs. pr. 3′ N.

No. 101. β 202. Ö.A. 7850. 7.3
7h 57m 49s — 26° 56′.2.

7.4 and 9.9 blue

1876.1	164°.8	8″.18	Cinc.	1 n
1877.1	160.8	7.70	„	1
1892.1	160.7	7.77	*β*	3
1892.2	160.3	7.62	Haverford	3
1897.9	160.8	7.39	See	1

Noted as double at Cordoba.
Prof. See measures also two more distant stars.
A more difficult pair closely S.f.

No. 102. Howe. Ö.A. 7857. 8.5
7h 57m 56s — 26° 58′.5.

8.6 and 11.6

1877.1	320°.7	2″.04	Cinc.	1 n

β 202 is in the field N.pr.

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No. 103. Innes 187. C. Z. 7 h. 4335. MAG. 9.2
7h 57m 59s — 34° 12′.4.

9.6 and 10.6

1897.3	N.f.	2″	Innes	1 n

The chief star may have a considerable p.m.

Another star 46″.5 S. = Cor. D. M. 34°,4230, 10 mag.

Another double star 40 secs. f. 5′ S.

No. 104. Innes 188. Cor. D. M.— 34°, 4240. 9.3
7h 58m 39s — 34° 17′.1.

9.9 and 10.2

1897.3	170°. ±	2″.5 ±	Innes	1 n

A 7.5 mag. star, orange, is 2′ N. 23 secs. f.

No. 105. β 903. Lal. 15,768. MAG. 8.5.
7h 59m 10s — 1° 34′.2.

8.9 and 10.0

1879.3	30°.5	1″.43	Cinc.	1 n
1879.6	33.7	1.47	β	5
1886.9	28.3	1.71	L. McC.	2–1
1888.1	32.3	1.69	Haverford	2–1
1892.1	32.8	1.54	β	3

Evidently fixed.

No. 106. Innes 8. Lac. 3130. 7.0
7h 59m 14s — 44° 23′.2.

7.1 and 10.2

1896.3	312°.7	2″.32	Sellors	3 n
1897.2	311.6	2.03	See	1

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No. 1. h. 4041. Lal. 15,859. MAG. 7.8.
8h 0m 41s — 22° 8′.9.

7.9 and 11.0

1837.1	179°.3	3″. ±	*h*	1 n

No. 2. h. 4045. C. Z. 8 h. 1. 8.2
8h 0m 42s — 50° 9′.7.

8.5 and 9.8

1835.0	219°.8	2″.5 ±	*h*	1 n
1895.3	224.3	4.57	Sellors	3

No. 3. Triple. Lac. 3146. 6.5.
8h 1m 53s — 33° 17′.0.

A = 6.6 orange. B = 9.5 blue. C = 10.7

A and B = *h* 4046

1837.3	84°.6	20″.0 ±	*h* (mirror)	1 n
1838.0	88.5	22.3	,, (o.g.)	1
1897.3	88.6	21.9	Innes.	1

A and C = Innes 189

1897.3	70°. ±	22″. ±	Innes	1

B and C

1897.3	0°. ±	7″. ±	Innes	1

Other stars near.

No. 4. Innes 190. Lac. 3164. 7.7
8h 2m 27s — 54° 42′.3.

Comes = 11.0

1897.3	100°. ±	2″.5 ±	Innes	1 n

Bris. 1893, mag. 8.7, is 28 secs. pr.

No. 5. Innes 164. Lac. 3158. 7.5
8h 2m 44s — 39° 48′.7.

7.8 and 9.2 both yellow

1897.1	95°. ±	0″.8 ±	Innes	2 n

S.f. ζ Argûs, mag. 2.5.

No. 6. λ 95. Lal. 15,930. MAG. 5.8
8h 2m 53s — 20° 15′.9.

Comes = 14.9

1897.8	191°.6	13″.84	See	1 n

No. 7. Melbourne [2]. Lac. 3175. 7.4
8h 3m 16s . — 60° 6′.1.

7.9 and 8.5

1877.1	345°.9	1″.91	Melbourne	1 n
1887.2	347.6	1.46	Pollock	1
1893.2	351.6	1.08	Sellors	1

Discovered in 1866.
Some change shown.

No. 8. β 334. Ö.A. 8050. 7.7
8h 3m 50s — 21° 50′.6.

8.1 and 8.9

1877.1	353°.8	2″.35	Cinc.	2 n
1880.2	354.2	2.4 ±	,,	1
1894.2	352.3	2.55	Sellors	2–1
1897.8	352.5	2.90	See	1

Prof. See points out that β's identification as followed by later observers is erroneous.

No. 9. β 583. Lal. 15,959. 8.7
8h 4m 18s — 6° 24′.5.

9.3 and 9.7

1878.1	68°.5	1″.82	β	1 n
1878.2	68.4	1.76	Cinc.	1
1888.1	69.4	1.76	Haverford	2
1892.1	69.5	1.70	β	3

Other measures.
A 7.5 mag. star 56 secs. f. 2′ S.

No. 10. Hough 352. Lal. 15,988. 6.1
8h 4m 54s — 15° 57′.3.

Comes = 12.7

1890.2	185°.4	5″.26	Hough	2 n

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No. 11. Innes 191. C. Z. 8 h. 319. MAG. 8.7
8h 5m 5s — 41° 37′.4.

9.2 and 9.7

1897.4	190.° ±	0.″9 ±	Innes	1 n

No. 12. Ormond Stone. Ö.A. 8124. 8.2
8h 5m 30s — 26° 50′.4.

8.6 and 9.6

1876.1	262.°1	3.″44	Cinc.	1 n
1879.1	259.2	3.00	,,	1
1885.1	261.7	3.34	,,	1

Both components observed on the meridian at Cordoba.

No. 13. Dunlop 63. Piazzi 8 h. 16. 6.6
8h 6m 24s — 42° 20′.7.

7.0 and 8.2

1836.0	80.°5	6.″02	*h*	2 n
1846.3	82.2	5.94	Jacob	2
1877.3	80.8	5.64	Melbourne	1
1879.3	80.5	5.33	Hargrave	1
1897.1	81.9	5.62	Lowell	3

Formerly called K Puppis.

No. 14. γ Argûs. 1.8
8h 6m 27s — 47° 2′.5.

Bris. 1916 = 4.9

1881.2	219.°4	42.″5	Tebbutt	3 n

This pair, with Bris. 1918 and another bright star, make one of the most brilliant fields in the heavens.

Other measures.

All relatively fixed.

P.m. = 0″.023 towards 243°.9

See :—

1881. Tebbutt, J., "Measures," *Observatory*, vol. iv. pp. 211–2.

No. 15. β 1064. 19 Puppis. MAG. 4.6
8h 6m 35s — 12° 37′.8.

Comes = 11.1

1889.08	244.°9	1.″84	β	4 n

A 9.0 mag. star 71″ S.pr. makes, with 19 Puppis, the old pair ℍ. IV. 26.

The p.m. of the chief star is about 0″.05, in which the ℍ star seems to share.

No. 16. Innes 165. C. Z. 8 h. 479. 8.9
8h 6m 40s — 48° 53′.9.

9.6 and 9.7

1897.1	270.° ±	0.″5 ±	Innes	1 n

Lac. 3195, mag. 7.0, is 45 secs. f., and Bris. 1927, mag. 7.5, is 51 secs. f.

In a coarse cluster.

No. 17. Dunlop 66. ε Volantis. 4.5
8h 7m 37s — 68° 19′.4.

Cape 1840, 1003 = 8.0

1835.0	23.°2	6.″69	*h*	2 n
1872.2	23.1	6.52	Russell	1
1877.2	23.9	6.08	Melbourne	2

The p.m. is very small.

No. 18. Innes 192. Lac. 3254. 7.7
8h 8m 42s — 68° 41′.7.

7.9 and 9.8

1897.7	170.° ±	1.″6 ±	Innes	2 n

No. 19. β 904. C. G. A. 10,922. 9.1
8h 8m 44s — 5° 28′.3.

Comes = 11.4

1880.2	81.°3	3.″12	β	4 n
1892.2	80.2	3.18	Haverford	4

In a cluster, and near *h* 2435, which consists of two 9th mag. stars 7″ apart.

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No. 20. λ 96. Lac. 3218. MAG. **6.6**
8h 9m 20s — 45° 57′.8.

7.2 and 7.5

1897.2	281.° ±	0.″26 ±	See	2 n

No. 21. Innes 193. Cor. D.M.— 34°, 4501. **8.1**
8h 9m 57s — 34° 26′.1.

8.5 and 9.3

1897.4	100.° ±	4.″ ±	Innes	2 n

In the field with a variable star. See *Ast. Nach.*, 3441.

No. 22. λ 97. C. Z. 8 h. 746. **8.8**
8h 10m 6s — 37° 25′.4.

A = 8.8 B = 12.5 C = 13.0

A and B

1897.2	1.°5	3.″14	See	1 n

A and C

1897.2	15.°5	16.″01	See	1 n

No. 23. β 454. Ö.A. 8280. **7.5**
8h 11m 0s — 30° 33′.1.

7.8 and 9.4

1892.2	16.°3	2.″41	β	3 n
1892.3	16.6	2.49	Haverford	2

See note.

No. 24. λ 98. C. G. A. 11,004. **6.8**
8h 11m 9s — 35° 23′.1.

Comes = 10.3

1897.2	72.°8	4.″75	Lowell	2 n

Independently noted at the Cape shortly after its discovery in Mexico.

Found by Mr Cogshall.

No. 25. Innes 166. C. Z. 8 h. 858. MAG. **9.0**
8h 11m 12s — 52° 4′.5.

A = 9.7 B = 9.9 C = 10.8

1897.1	pr.	3″ and 6″	Innes	1 n

In a low power field, with Lac. 3239, mag. 7.2, which is 10′ N.pr.

No. 26. Cape 8. Lac. 3231. **6.6**
8h 11m 51s — 30° 37′.1.

6.8 orange, and 9.0

1897.3	15.° ±	3.″ ±	Innes	1 n

A fine pair.

See note.

No. 27. β 905. Lal. 16,242. **7.7**
8h 11m 54s — 16° 0′.6.

7.8 and 10.3

1879.7	12.°2	3.″75	β	4 n
1884.6	13.7	3.75	Cinc.	2
1893.2	12.1	3.76	Haverford	1

No. 28. Innes 167. C. Z. 8 h. 939. **8.5**
8h 11m 56s — 62° 11′.1.

9.0 and 10.0

1897.1	240.° ±	1.″4 ±	Innes	1 n

A neat pair, brighter than the mag. given, which is from the C. G. A.

C. Z. 8h. 986, mag. 8.5, is 28 secs. f. 3′ N.

No. 29. β 102. Lal. 16,234. **7.0**
8h 11m 58s — 8° 42′.3.

7.1 and 9.7

1877.1	122.°2	3.″09	Cinc.	2 n
1892.1	120.8	3.30	β	3

"No change since 1875." β.

Lal. 16,228, mag 7.7, is closely S.pr.

Nos. 23 and 26 :—The measures under No. 23 should be transferred to No. 26, β's identification being erroneous. In No. 26 "Cape 8" should accordingly be replaced by β 454.

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No. 30. Howe. Lal. 16,235. MAG. 8.3
8h 12m 12s — 2° 54′.0.

8.4 and 11.9

1879.3	249°.0	1″.49	Cinc.	1 n

A brighter star 10′ S.pr.

No. 31. β 906. Lal. 16,259. 8.7
8h 12m 18s — 15° 56′.7.

8.8 and 11.6

1880.0	187°.1	3″.45	β	4 n
1884.1	188.1	3.27	Cinc.	2–1

Near β 905; both some way pr. 21 Puppis, mag. 6.8.

No. 32. Howe 9. C. Z. 8 h. 1002. 8.7
8h 13m 17s — 26° 57′.7.

9.2 and 9.7

1877.1	115°.5	3″.26	Cinc.	1 n
1880.2	113.6*	3.26	,,	1
1886.2	117.6	3.23	,,	1

No. 33. Gilliss 91. C Carinae. 5.3
8h 13m 45s — 62° 36′.3.

5.4 and 8.6

1877.1	62°.6	4″.09	Melbourne	1 n
1881.7	64.2	3.18	Russell	2
1892.4	61.6	3.67	Sellors	2

Also registered as Russell 82, and again as a new pair by the Harvard Observatory at Arequipa.

The companion was seen at the Cape in 1875.

A coarse faint pair *h* 4077 is in the field.

No. 34. h. 4073. Lac. 3258. 7.0
8h 14m 30s — 37° 3′.8.

7.4 and 8.0

1836.0	170°.±	1″.±	*h*	1 n
1878.2	176.9	2.31	Russell	1
1879.3	183.9	1.95	Hargrave	1
1895.3	179.9	1.73	Sellors	3
1897.2	179.2	2.34	See	1

About 45′ S.pr. *q* Puppis, mag. 4.7.

No. 35. β 907. B.D.—12°, 2462. MAG. 8.8
8h 15m 0s — 12° 31′.0.

9.0 and 11.2

1879.7	57°.8	0″.82	β	2 n

N.pr. Lal. 16,354, mag. 7.0.

No. 36. h. 4084. C. Z. 8h. 1280. 9.2
8h 15m 55s — 58° 51′.9.

Both = 10.0

1836.1	266°.1	4″.±	*h*	1 n
1880.3	267.7	2.88	Hargrave	1
1888.4	268.1	3.54	Russell	1

Also registered as Russell 83.

Lac. 3289, mag. 6.8, is 60″ N.pr.

No. 37. Innes 9. Lac. 3329. 6.8
8h 15m 55s — 73° 29′.9.

7.3 and 8.0

1894.9	280°.±	0″.9 ±	Innes	2 n
1898.3	310.±	0.9 ±	,,	1

An 11th mag. star 60″ ± N.

No. 38. Σ 1216. Lal. 16,375. 7.0
8h 16m 16s — 1° 17′.0.

7.5 and 8.0

1825.2	109°.5	0″.53	Σ	1 n
1831.2	115.2	0.48	,,	4
1851.3	139.4	0.49	OΣ	2
1863.3	151.1	.....	Dembowski	7
1873.3	153.8	.....	,,	4
1878.2	158.8	0.54	β	4–3
1880.9	166.7	0.36	Hall	3
1891.2	180.6	0.42	Bigourdan	1
1893.2	183.6	0.35	Lewis	3
1896.2	191.5	0.37	Comstock	1
1897.9	192.7	0.51	Hussey	3

A binary; Gore finds a period of 174.7 years, perihelion 1904.

There is a paper by β on this pair in *Astronomy and Astro-physics*, 1892, vol. i., pp. 662–3, and one by Prof. A. Hall in the *Astr. Journal*, vol. xii. No. 269, 1892.

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No. 39. h. 4085. Lac. 3281. MAG. 5.3
8h 17m 34s — 36° 9′.9.

Comes = 11.4

1836.0	271°.2	4″. ±	*h*	1 n
1895.3	270.0	6.09	Sellors	3

Not seen in 1879 at the Sydney Observatory.

No. 40. h. 4087. C. G. A. 11,225. 7.3
8h 18m 35s — 40° 40′.3.

8.0 and 8.1

1837.6	327°.0*	0″.9 ±	*h*	2 n
1858.1	315.1	1.45	Jacob	3–2
1879.3	308.9	1.28	Hargrave	1
1887.4	299.7	1.85	Tebbutt	2–1
1896.2	302.9	1.76	Sellors	3
1897.2	303.7	1.62	See	1

The nature of the change shown is doubtful.
Two distant faint *comites* also noted by *h*.

No. 41. Innes 67. B Velorum. 4.8
8h 19m 27s — 48° 10′.2.

5.0 and 7.0

1897.3	142°. ±	1″. ±	Innes	2 n

The p.m. is very small.
There is a faint star some distance away.

No. 42. h. 4093. Lac. 3324. 6.5
8h 22m 37s — 38° 43′.8.

7.1 and 7.4

1847.2	121°.5	8″.12	Jacob	1 n
1881.3	122.4	7.87	Hargrave	1

Probably fixed.
Two stars, mags. 9.1 and 9.2, are about 9′ N.f.

No. 43. h. 4104. A Velorum. 5.5
8h 25m 55s — 47° 35′.7.

5.6 and 8.3

1836.5	242°.3	4″.40	*h*	3 n
1847.1	241.5	3.84	Jacob	1
1876.1	241.3	3.66	Sydney	5

C. Z. 8 h. 2110, mag. 9.4, is 19″ distant.

No. 44. Dunlop 70. Lac. 3366. MAG. 5.2
8h 26m 5s — 44° 23′.4.

5.3 and 7.9

1835.5	350°.3	5″.58	*h*	4 n
1852.4	347.9	4.55	Maclear	2
1875.3	348.3	4.67	Sydney	3
1887.1	348.0	4.51	Tebbutt	1
1893.2	350.0	4.50	Scott	1
1897.1	348.6	4.71	Lowell	4

Other measures.
h's distance seems to be 1″ too great.

No. 45. h. 4106. Cape 1880, 4412. 9.0
8h 26m 36s — 36° 23′.0.

Comes = 10.5

1835.1	137°.7	18″. ±	*h*	1 n
1881.3	143.0	8.00	Hargrave	1

About 6 secs. pr. the orange coloured star Lac. 3364, mag. = 7.0 (C. P. D. = 8.8).

No. 46. Innes 168. Lac. 3376. 6.9
8h 27m 17s — 44° 24′.0.

Comes = 10.7

1897.2	82°. ±	3″. ±	Innes	2 n

An easy pair to have escaped detection.
Dunlop 70, mag. 5.2, is 72 secs. pr. See No. 44.

No. 47. h. 4107. Lac. 3375. 6.6
8h 27m 43s — 38° 43′.6.

6.7 and 9.1

1836.0	327°.4	3″. ±	*h*	1
1847.1	327.4	4.60	Jacob	2
1851.1	330.2	4.45	,,	3

Another star 32″ away.
Lac. 3373, mag. 7.2, is 18 secs pr.

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No. 48. β 205. Lac. 3377. MAG. 5.9
8h 28m 46s — 24° 15′.9.

6.6 and 6.8

1874.19	130°. ±	0″.5 ±	β	1 n
1877.11	100.6	1.02	Cinc.	1
1878.53	100.3	0.63	,,	3–1
1882.21	96.6	0.5 ±	Schiaparelli	3
1886.17	90.1*	0.80	Cinc.	2
1890.28	81.9	0.70	β	2
1891.24	77.1	0.63	,,	1
1892.19	75.7	0.66	,,	2
1893.20	72.6	0.3 ±	Sellors	1
1897.23	64.4*	0.81	Aitken	3

A binary pair.
C. P. D. mag. = 7.5.

No. 49. Sellors 8. Lac. 3410. 6.4
8h 29m 18s — 52° 52′.3.

6.7 and 8.0

1892.3	301°.8	0″.43	Sellors	3 n
1897.1	297.2	0.59	See	2

Seen whilst sweeping with a 6-inch refractor in 1894, when the angle and distance were estimated 295°, 1″.4.

No. 50. Innes 195. Lac. 3408. 6.9
8h 30m 43s — 37° 16′.0.

7.0 orange, and 9.8 blue

1897.3	42°. ±	2″. ±	Innes	2 n

A 9.8 mag. star closely S.f.

No. 51. β 206. Yarnall$_3$ 3490. 7.5
8h 31m 9s — 24° 45′.8.

7.9 and 8.7

1877.1	281°.6	1″.94	Cinc.	2 n
1880.3	279.7	1.55	Pritchett	3
1889.1	280.3	1.76	Haverford	3

The f. of two stars 1m 22s apart.

No. 52. Innes 68. C. Z. 8 h. 2571. MAG. 8.6
8h 32m 52s —30° 28′.9.

8.8 and 10.3

1898.3	68°.2	8″.15	See	1 n

No. 53. β 207. Lal. 17,091. 6.7
8h 34m 10s — 19° 23′.1.

6.8 red, and 9.5 blue

1876.1	103°.6	4″.32	Dembowski	3 n
1877.1	106.0	4.50	Cinc.	3–2
1880.7	102.2	4.18	β	2
1890.9	101.6	4.34	Haverford	4

Other measures.
The chief star has been thought variable.
Combined photo mag. = 7.7 (C. P. D.).

No. 54. β 208. Lal. 17,103. 5.1
8h 34m 45s — 22° 19′.3.

5.4 and 6.6

1874.20	30°.4	1″.4 ±	β	1 n
1877.11	32.0	1.74	Cinc.	1
1878.43	33.9	1.37	,,	2
1882.21	40.9	1.21	Schiaparelli	3
1889.15	47.5	1.06	β	2
1892.11	52.3	0.70	,,	3
1894.26	47.6	0.57	Comstock	1
1895.32	55.5	0.6 ±	,,	1
1896.26	65. ±	.....	,,	1
1897.83	74.7	0.39	See	1

Common p.m. of 0″.503 towards 324°.6.
A binary system, distance at present decreasing.
See :—
1892. Burnham, S. W., *Astronomy and Astrophysics*, pp. 464–465.

No. 55. h. 4125. Lac. 3475. 5.4
8h 35m 32s — 62° 30′.1.

5.5 yellow, and 10.4 blue

1834.2	232°.6	8″. ±	*h*	2 n
1872.1	233.7	8.04	Russell	1

C. P. D. mag. = 7.2.

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No. 56. λ 102. Lac. 3460. MAG. 7.5
8h 35m 37s — 39° 26′.7.

8.1 and 8.7

	°	″		
1897.2	240.9	0.44	See	1 n

No. 57. Harvard. Lac. 3467. 6.5
8h 35m 55s — 52° 44′.3.

Noted as double at Arequipa in 1891. See *Harvard Circular*, No. 18.

The nearest star seen here is a 10.5 mag. N.pr. (300° ±) at about 20″ distance.

No. 58. Lalande 66. Lal. 17,125. 7.8
8h 35m 59s — 11° 48′.7.

8.4 and 8.7

	°	″		
1822.0	300.4	.....	Σ	2 n
1830.9	301.4	4.91	„	3
1868.5	301.4	4.94	Dembowski	4
1883.1	302.5	5.47	Cinc.	1

Also registered as Σ 1260.

No. 59. Cordoba [18]. Piazzi 8 h. 148. 5.3
8h 36m 39s — 39° 54′.5.

5.4 and 8.1

	°	″		
1894.4	61.2	3.8	Bailey	2 n
1897.1	60.4	3.97	See	3

Measures from Prof. See.

Noted as double in the U. A. Also registered as Innes 69 in error.

No. 60. Cordoba [19]. C. Z. 8 h. 2961. 8.0
8h 36m 46s — 31° 27′.3.

8.2 and 9.9

		″		
1880	N.pr.	5 ±	C. G. A.	3 n

A similar pair = Yarnall$_8$ 3655, about 25′ S., was also noted at Cordoba, and measured in 1877 at Cincinnati.

No. 61. h. 4128. Lac. 3490. MAG. 6.4
8h 37m 6s — 59° 57′.8.

6.9 and 7.4

	°	″		
1836.7	221.9	2.51	*h*	2 n
1850.0	218.4	2.13	Maclear	1
1854.0	220.9	2.06	Jacob	3–2
1873.1	219.6*	2.28	Russell	1
1882.3	215.2	1.28	Hargrave	1

Other measures.

Hargrave's measure is set against Lac. 3465 in the *Sydney Catalogue*.

No. 62. Hough 355. Lal. 17,186. 8.4
8h 37m 55s — 2° 20′.2.

Both = 9.2

	°	″		
1892.7	184.4	0.39	Hough	2 n

No. 63. h. 4130. Lac. 3497. 7.0
8h 38m 17s — 57° 11′.3.

7.1 and 9.7

	°	″		
1836.7	226.1	3.5 ±	*h*	2 n
1850.0	223.5	4.07	Maclear	1
1872.7	225.8	4.08	Russell	2
1897.1	227.2	3.48	See	2

This is probably the same star as *h* 4142. See original note to Mr Russell's measure.

No. 64. Lalande 67. Piazzi 8 h. 160. 6.8
8h 40m 18s — 2° 14′.2.

Piazzi 8h. 159 = 8.5

	°	″		
1831.0	259.1	4.70	Σ	4 n
1867.2	259.6	4.52	Dembowski	3
1879.1	260.5	4.63	Cinc.	2

Also called Σ 1270 and South 580.

Hough 355 is some distance pr. and 6′ S. See No. 62.

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No. 65. Innes 10. δ Argûs. MAG. 2.0
8h 41m 56s — 54° 20′.5.

2.1 and 5.2

1894.4	177°.4	2″.15	Bailey	2 n
1894.9	170. ±	2. ±	Innes	3
1895.4	160.4	1. ±	Tebbutt	4
1896.3	173.5	1.81	Sellors	3
1897.2	178.7	3.01	See	1
1897.2	172.8	1.56	Innes	2–1

The p.m. of δ Argûs is o″.094 towards 177°.3.

h noted a 9.8 mag. star some distance away, which seems unchanged = *h* 4136.

Inserted as a double star in *Harvard Circular*, No. 18.

Prof. Bailey's measure is from Prof. See's list.

No. 66. Rumker 9. Lac. 3545. 6.6
8h 42m 43s — 58° 21′.5.

7.1 and 7.5

1836.8	290°.1	4″.87	*h*	5 n
1872.2	289.9	4.51	Russell	1
1897.0	290.6	3.91	See	3

In Mr Russell's measure, the star is miscalled *h* 4140.

Two distant *comites*, mags. 10 and 11.

No. 67. β 586. Lal. 17,355. 6.8
8h 42m 45s — 16° 41′.1.

6.9 and 9.4

1878.1	53°.2	0″.75	β	1 n
1878.2	55.6	0.7 ±	Cinc.	2
1878.3	45.7	0.54	Dembowski	1

No other measures of this fine pair have been found.

The p.m. is very small.

No. 68. Jacob [5]. Bris. 2199. 7.5
8h 42m 57s — 42° 12′.0.

7.7 and 9.5

1856.3	314°.9	1″.88	Jacob	2 n
1897.1	314.6	1.92	Lowell	4

In a coarse cluster.

There is a wide pair S.f., measured by Jacob in 1856 and the Lowell observers in 1897 = Cape 1880, 4655, mag. 8.3.

No. 69. Innes 70. Lac. 3539. MAG. 7.0
8h 43m 57s — 38° 34′.4.

7.2 and 9.2

1897.3	110°. ±	1″.5 ±	Innes	2 n

No. 70. β 1069. Lal. 17,416. 7.5
8h 44m 39s — 10° 38′.9.

Comes = 11.5

1889.1	60°.8	2″.13	β	3 n

No. 71. Hough 356. Ö.A. 9023. 7.9.
8h 45m 0s — 26° 3′.2.

8.5 and 8.8

1890.3	264°.5	0″.81	Hough	1 n

No. 72. Sellors 9. C. Z. 8 h. 3683. 8.0
8h 45m 25s — 63° 26′.6.

8.4 and 9.4

1893.2	2°.6	0″.96	Sellors	2 n
1895.3	0.6	1.22	,,	3

No. 73. h. 4143. Ö.A. 9052. 8.5
8h 46m 20s — 22° 50′.7.

8.9 and 9.3

1835.2	131°.8	1″.5 ±	*h*	1 n
1877.2	128.0	3.62	Cinc.	1
1884	131.9	3.11	,,	1

No. 74. h. 4144. Yarnall 3817. 7.0
8h 46m 28s — 35° 33′.4.

7.1 and 10.0

1838.0	321°.7	2″. ±	*h*	2 n
1879.3	313.1	2.17	Hargrave	1
1897.2	316.6	2.08	See	1

A 9.2 mag. star is S.pr.

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No. 75. β 587. 15 Hydrae. MAG. 5.5
8h 46m 40s — 6° 48′.1

5.6 and 7.7

1878.2	160.0	0″.45	β	2 n
1878.4	163.6	0.46	Cinc.	3–1
1879.2	157.8	0.47	β	2
1880.2	[152.2]	0.4 ±	Cinc.	1
1892.1	151.9	0.59	β	3
1897.2	143.4	0.93	Aitken	3

Common p.m. of 0″.07 towards 270°.
Two distant companions make up H. V. 120.

No. 76. β 407. W.B. 8 h. 1159. 8.2
8h 46m 49s — 6° 24′.2.

Comes = 10.6

1877.8	165.4	6″.09	Dembowski	1 n
1879.1	165.4	5.47	Cinc.	1
1879.5	164.5	5.94	β	3

No. 77. Hargrave 19. Lac. 3588. 7.4
8h 46m 51s — 65° 3′.5.

Comes = 10.4

1882.3	149.4	3″.25	Hargrave	1 n

Also catalogued as Russell 349.

No. 78. Schjellerup$_2$ 13. Lal. 17,509. 8.4
8h 47m 2s — 10° 45′.8.

8.9 and 9.6

1867.1	352.4	2″.17	Harvard	2 n
1873.7	352.3	2.16	Dembowski	2
1878.2	349.7	2.11	Cinc.	2
1886.1	348.6	2.63	L. McC.	1
1886.2	352.8	2.21	Cinc.	1

No. 79. Harvard. *f* Velorum. 5.2
8h 47m 10s — 46° 9′.3.

Comes = 9.6

1894.4	81.2	3″.7	Bailey	2 n
1897.1	83.6	3.10	See	4

Discovered independently by Prof. See and the writer in January 1897, within a few days of each other. Prof. See then ascertained that the star had previously been noted as double by the Harvard Observatory in Peru, and communicated the information. See also *Harvard Circular*, No. 18.

Prof. Bailey's measure is from Prof. See's list.

No. 80. h. 4148. Cape 1880, 4705. MAG. 8.3
8h 47m 56s — 53° 44′.3.

8.5 and 10.5

1837.0	106.6	4″ ±	*h*	1 n
1874.1	112.5	6.46	Russell	1
1897.1	110.1	5.50	Lowell	3

A minute pair, *h* 4145, 5″ apart, is N.pr.

No. 81. Harvard. Lac. 3609. 5.4
8h 49m 14s — 66° 25′.2.

Noted as double at Arequipa in 1891. See *Harvard Circular*, No. 18.

With the 7-inch Cape refractor an 11th mag. star, at about 20″ ±, is seen S.pr. about 230° ±.

No. 82. Hargrave 20. C. Z. 8 h. 3974. 8.5
8h 49m 17s — 57° 59′.3.

8.9 and 9.8

1883.3	272.1	1″.67	Hargrave	1 n
1893.2	276.1	1.40	Sellors	1

No. 83. β 24. Lal. 17,586. 7.0
8h 49m 22s — 8° 22′.9.

7.3 and 8.5

1875.2	171.9	1″.03	Dembowski	3 n
1878.2	177.3	1.12	β	1
1878.8	175.0	1.08	Cinc.	3
1886.8	173.5	1.26	L. McC.	1
1888.9	173.8	1.19	Haverford	4
1893.2	177.4	1.06	,,	2

About 45′ S. of 17 Hydrae.

No. 84. Cape 9. Lac. 3593. 6.8
8h 49m 39s — 51° 45′.0.

7.0 and 9.0

1877.7	78.0	3″.85	C. G. A.	4 n
1897.1	81.9	2.93	Lowell	2

Noted at the Cape in 1876.

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No. 85. β 103. Lal. 17,611. MAG. 7.8
8h 50m 0s — 7° 26′.3.

Comes = 10.8

1875.1	73°.9	2″.90	Dembowski	2 n
1879.5	73.9	2.86	β	3
1880.8	73.7	2.71	Pritchett	2
1886.2	72.2	2.77	Cinc.	1

Fixed. N.pr. 17 Hydrae. See next star.

No. 86. H. II. 77. 17 Hydrae. 6.3
8h 50m 36s — 7° 35′.3.

6.9 and 7.2

1792.6	360°.3	″.....	H	2 n
1831.6	358.8	4.33	Σ	3
1848.3	358.5	4.25	Philpott	1
1867.2	358.2	4.16	Dembowski	3
1883.2	359.1	4.18	Cinc.	2
1893.2	359.1	4.30	Haverford	2

Fixed. Small common p.m. of about 0″.02.
Also recorded as Σ 1295.

No. 87. β 210. Lal. 17,696. 7.2
8h 52m 13s — 17° 3′.0.

7.9 and 8.0

1876.1	183°.2	2″.81	Cinc.	7 n
1886.8	183.3	2.76	L. McC.	3–2
1893.2	182.6	2.67	Sellors	1

Fixed. Other measures.

No. 88. Hough 358. Lal. 17,733. 7.0
8h 53m 17s — 18° 30′.1.

Comes = 12.0

1892.2	290°.4	1″.77	Hough	2 n
1898.3	298.5	1.91	See	1

No. 89. Russell 87. H Velorum. MAG. 4.7
8h 53m 18s — 52° 20′.3.

4.8 yellow and 7.4 blue

1881.3	240°.5	3″.47	Russell	1 n
1896.3	340.1	3.33	Innes	1
1897.1	339.6	3.03	See	2

Unless there is a misprint in the first angle, the change is considerable in this fine pair.

In the Harvard list of new pairs found at Arequipa in 1891.

No. 90. Cordoba [20]. Lac. 3615. 7.2
8h 53m 30s — 42° 52′.2.

7.8 and 8.1

1879.2	98°.6	2″.67	C. G. A.	2 n

Gilliss 975, mag. 9.5, is 43″ N.

No. 91. Innes 71. Bris. 2285. 7.5
8h 53m 44s — 49° 17′.7.

7.8 and 9.2

1896.4	N.pr.	5″.±	Innes	2 n

The pr. of three stars, mags. 7.5, 7.5, and 7.0 respectively.

No. 92. Hough 359. O.A. 9193. 8.6
8h 54m 8s — 22° 27′.0.

9.1 and 9.8

1893.2	7°.9	0″.70	Hough	1 n
1898.3	15.3	0.82	See	1

Ö.A. 9194, mag. 8.5, is 7′ S.

No. 93. Innes 287. Bris. 2310. 8.0
8h 55m 5s — 73° 39′.5.

8.3 and 9.8, both white

1898.3	255°.±	2″.±	Innes	2 n

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No. 94. β 409. Lal. 17,812. MAG. 7.0
$8^h\ 55^m\ 53^s$ — 8° 48′.0.

Comes = 10.1

1878.3	684°.3	9″.65	Dembowski	1 n
1879.5	184.7	9.77	β	3
1884.0	185.6	9.94	Engelmann	5

Between two stars, both 7.5 mag.

No. 95. λ 108. Lac. 3646. 6.6
$8^h\ 56^m\ 44^s$ — 42° 46′.9.

Comes = 13.0

1897.2	45°.8	2″.80	Lowell	2 n

Found by Mr Cogshall.

No. 96. h. 4165. Lac. 3667. MAG. 5.4
$8^h\ 58^m\ 38^s$ — 51° 47′.7.

5.6 and 7.2

1837.2	88°.2	1″.41	*h*	2 n
1848.1	85.6	1.5 ±	Jacob	1
1858.1	89.9	1.38	„	2
1887.3	96.5	0.88	Pollock	1
1895.3	96.9	1.04	Sellors	3
1897.1	102.1	1.01	See	4

A fine pair.
Some change.

No. 97. h. 4167. C. Z. 8 h. 4736. 8.9
$8^h\ 58^m\ 49^s$ — 65° 57′.4.

Comes = 12.4

1836.1	25°.1	2″.5 ±	*h*	2 n

α Volantis, mag. 4.1, is S.f.

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No. 1. Sellors 16. Bris. 2339. MAG. 7.5
9h 1m 58s — 64° 17′.2.

7.7 and 9.6

1895.3	306°.9	1″.02	Sellors	3 n

No. 2. Howe 10. Ö.A. 9348. 7.7
9h 2m 7s — 31° 11′.6.

8.2 and 8.7

1877.1	304°.6	3″.38	Cinc.	2 n

No. 3. h. 4178. Lac. 3693. 6.9
9h 2m 8s — 57° 27′.2.

7.0 and 10.4

1836.6	164°.3	3″.±	*h*	2 n

(1897 seen).

No. 4. Innes 196. Lac. 3687. 8.5
9h 2m 26s — 49° 44′.6.

9.0 and 9.5, both white

1897.4	150°.±	0″.7 ±	Innes	1 n

No. 5. λ 109. λ Argûs. 2.1
9h 4m 19s — 43° 1′.7.

Comes = 14.0

1897.2	133°.7	17″.11	See	2 n

The p.m. is 0″.058 towards 279°.9.
Mag. in C. P. D. = 6.0.

No. 6. Innes 197. C. Z. 9 h. 331. 8.3
9h 4m 55s — 28° 24′.7.

9.0 and 9.2

1898.3	231°.2	1″.76	See	1 n

No. 7. β 410. Piazzi 9 h. 5. 7.0
9h 5m 22s — 25° 23′.8.

7.3 and 8.6

1877.1	162°.5	1″.73	Cinc.	2 n
1892.2	161.2	1.67	β	3
1892.2	160.9	1.63	Haverford	3

No. 8. Cordoba [21]. C. Z. 9 h. 448. MAG. 8.3
9h 6m 17s — 43° 46′.1.

8.8 and 9.5

1881.0	45°.9	2″.87	C. G. A.	3 n

No. 9. Innes 288. Lac. 3767. 8.2
9h 6m 56s — 74° 21′.0.

8.7 and 9.2

1898.3	260°.±	0″.7 ±	Innes	1 n

No. 10. β 336. Lal. 18,173. 8.3
9h 7m 6s — 16° 24′.1.

8.7 and 9.7

1876.2	238°.3	1″.93	Dembowski	2 n
1878.2	241.0	1.81	Cinc.	2

No. 11. Innes 169. Lac. 3720. 7.2
9h 7m 15s — 42° 51′.4.

7.6 and 8.6

1897.1	5°.±	0″.6 ±	Innes	1 n

Bris. 2373, mag. 7.8, is closely S.f.

No. 12. λ 110. C. Z. 9 h. 576. 8.5
9h 8m 9s — 46° 28′.6.

9.0 and 9.5

1897.1	48°.6	0″.94	Lowell	3 n

Found by Mr Cogshall.
About 20′ S.f. Lac. 3727, mag. 6.2.

No. 13. h. 4188. Lac. 3729. 6.7
9h 8m 48s — 43° 12′.1.

7.1 and 8.1

1835.7	286°.9	3″.07	*h*	2 n
1847.1	284.9	2.89	Jacob	3
1850.3	285.6	2.74	„	2
1879.4	285.4	2.43	Hargrave	1
1897.1	282.5	2.94	Lowell	3

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No. 14. h. 4190. Lac. 3742. MAG. 7.0
9h 8m 49s — 57° 33′.5.

Comes = 11.0

1837.0	21.°9	7.″±	*h*	1 n
1879.4	21.5	7.73	Hargrave	1

No. 15. β 908. B.D.—7°, 2762. 9.1
9h 9m 25s — 7° 52′.8.

9.3 and 11.0

1880.3	234.°6	0.″82	β	3 n
1892.2	230.7	0.74	,,	2

1st Munich 3956, mag. 8.9, is 61″ N. There is also a 12.5 mag. star in the field.

No. 16. Hough 363. Lal. 18,282. 7.3
9h 10m 27s — 19° 42′.4.

7.5 and 9.5

1890.3	176.°1	1.″56	Hough	2 n

No. 17. h. 4191. z Velorum. 5.3
9h 10m 41s — 42° 48′.8.

Comes = 11.0

1835.6	10.°3	4.″±	*h*	2 n
1897.1	11.7	5.61	Lowell	4

The p.m. is small.

No. 18. β 212. Lal. 18,296. 7.5
9h 11m 10s — 7° 56′.0

8.0 and 8.5

1874.1	218.°5	1.″5±	β	1 n
1875.7	230.5	1.48	Dembowski	2
1878.2	225.8	1.36	Cinc.	1
1880.5	228.9	1.26	β	4
1885.2	225.6	1.47	Cinc.	1
1887.0	224.7	1.49	L. McC.	1
1888.6	225.4	1.35	Haverford	3

Fixed.

No. 19. Innes 11. Lac. 3758. MAG. 6.5
9h 11m 37s — 45° 8′.3.

6.9 and 7.7

1896.3	273.°6	1.″21	Sellors	3 n
1897.2	271.6	0.75	See	2

No. 20. λ 111. k Velorum. 4.7
9h 11m 45s — 36° 59′.8.

Comes = 13.0

1897.4	125.°7	11.″27	See	1 n

No. 21. h. 4193. Lal. 18,330. 7.7
9h 11m 49s — 22° 42′.7.

8.0 and 9.3

1835.1	126.°4	2.″±	*h*	1 n
1877.1	117.7	3.18	Cinc.	1
1884.8	119.3	3.10	,,	2
1898.3	118.4	3.27	See	1

No. 22. h. 4196. C.P.D.—51°, 2073. 8.5
9h 13m 23s — 51° 30′.0.

9.0 and 9.6, both yellow

1837.0	126.°5	3.″±	*h*	1 n
1882.4	119.1	2.73	Hargrave	1

A 9.4 mag. star is closely S.pr.

No. 23. H. C. Wilson. Lal. 18,445. 7.5
9h 15m 46s — 23° 3′.3.

7.7 and 9.7

1882.1	39.°6	1.″±	Cinc.	1 n
1886.2	36.7	1.38	,,	2

No. 24. Innes 198. Lac. 3787. 8.0
9h 16m 23s — 28° 47′.7.

8.4 and 9.4

1898.3	182.°0	0.″45	See	1 n

Cape, 1880, 4984, mag. 7.2, is 16 secs. pr. 6′ N.

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No. 25. h. 4200. Piazzi 9 h. 61. MAG. 7.3
9h 16m 30s — 31° 20′.1.

7.8 and 8.5

1836.1	72°.0	2″.±	*h*	1 n
1891.3	71.5	3.17	Sellors	1

Both components were observed on the meridian at Cordoba.
The p.m. is small.

No. 26. Innes 170. Gilliss 1063. 7.5
9h 17m 4s — 34° 55′.9.

7.7 and 9.8

1897.2	45°.±	1″.2 ±	Innes	2 n

No. 27. h. 4206. Lac. 3846. 5.4
9h 17m 36s — 74° 28′.3.

Comes = 10.8

1835.1	340°.8	5″.±	*h*	1 n
1894.8	340. ±	8. ±	Innes	2

Another star 40″ distant.
The p.m. is insensible.
At one time the writer thought the chief star a close pair. Not confirmed here.

No. 28. Harvard 123. Ö.A. 9667. 7.7
9h 19m 18s — 23° 13′.8.

Comes = 11.0

1868.2	4°.1	4″.41	Harvard	1 n
1898.3	4.4	4.48	See	1

No. 29. β 590. 29 Hydrae. 6.7
9h 22m 21s — 8° 47′.4.

Comes = 11.7

1878.2	176°.8	10″.8	β	2 n
1891.3	176.0	10.9	,,	2

The p.m. of the chief star is 0″.068 towards 268°.3.

No. 30. h. 4213. Lac. 3866. 6.2
9h 22m 58s — 61° 31′.2.

Comes = 9.4

1835.7	324°.1	8″.±	*h*	4 n
1876.8	326.3	8.82	Sydney	2

No. 31. Innes 72. I Velorum. MAG. 5.2
9h 23m 3s — 52° 56′.7.

B and C

1896.5	.....	3″.±	Innes	1 n

The chief star is 50″ ± f., and has no p.m.

No. 32. Innes 199. Lac. 3893. 8.5
9h 23m 25s — 69° 58′.6.

8.8 and 10.0

1897.4	135°.±	2″.±	Innes	1 n

Mag. in C. P. D. = 7.4.

No. 33. β 213. Lal. 18,648. 8.0
9h 23m 25s — 7° 39′.1.

8.3 and 9.7

1874.2	185°.5	1″.5 ±	β	1 n
1875.8	177.2	1.60	Dembowski	2
1879.2	177.8	1.35	Cinc.	1
1880.2	179.3	1.53	β	2
1892.1	179.5	1.62	,,	3

No. 34. Σ 1357. Lal. 18,650. 7.5
9h 23m 27s — 9° 33′.0.

Comes = 10.2

1831.2	51°.4	7″.54	Σ	3 n
1868.2	54.4	7.25	Dembowski	
1882.2	52.7	7.77	Cinc.	

No. 35. β 591. W.B. 9 h. 477. 7.8
9h 24m 33s — 2° 40′.6.

8.2 and 9.0

1878.1	35°.8	0″.73	β	2 n
1878.2	31.9	0.73	Dembowski	1
1884.0	39.8	0.67	Engelmann	5
1892.1	35.4	0.72	β	3

Near τ Hydrae, mag. 4.9.

No. 36. λ 113. Piazzi 9 h. 105. 4.7
9h 25m 28s — 26° 9′.1

Comes = 14.8

1897.8	178°.1	4″.13	See	1 n

The mag. is from the Harvard Meridian Photometry. The U. A. gives 6.0, and the C. P. D. 7.0.
Piazzi 9 h. 101, mag. 7.2, is closely pr.

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No. 37. β 339. Lal. 18,737. MAG. 8.4
9h 26m 14s — 15° 18′.0.

8.7 and 10.0

1876.2	215°.7	1″.28	Dembowski	2 n
1878.5	215.1	1.32	Cinc.	2–1
1885.2	220.2	1.50	,,	1
1888.2	219.3	1.31	Haverford	1

No. 38. Jacob [6]. Lac. 3873. 7.0
9h 26m 18s — 28° 19′.5.

7.4 and 8.2

1858.2	244°.6	0″.55 ±	Jacob	2 n
1879.1	236.7	0.69	Cinc.	3–1
1889.2	244.8	1.05	β	3
1897.9	245.4*	0.42	See	1

This star is identical with Innes 171.
See note.

No. 39. Dunlop 78. ζ1 Antliae. 6.1
9h 26m 29s — 31° 26′.9.

5.7 and 6.5

1836.3	210°.6	8″.38	*h*	4 n
1876.2	211.8	8.43	Cinc.	5
1877.1	211.5	8.25	,,	1
1893.2	210.5	8.49	Scott	1

No. 40. Copeland [1]. ψ Argûs. 3.5
9h 26m 46s — 40° 1′.7.

3.7 and 5.7, both yellow

1883.3	45°. ±	0″.8 ±	Copeland	1 n
1896.4	S.pr.?	.....	Innes	1
1897.1	260. ±	0.7 ±	,,	1
1897.1	255.9	0.49	See	4
1897.1	256.9	0.81	Cogshall	1

At the time the observation was made on 1896.4, it was noted, "Very doubtful if even elongated;" whereas in 1897.1 the stars were all but separated.

Common p.m. of 0″.236 towards 290°.6.

Measured as a new pair by Prof. See.

A system of the highest interest, and probably of short period.

See note.

No. 41. Innes 31. C. Z. 9 h. 2194. MAG. 9.2
9h 27m 53s — 56° 32′.5.

9.6 and 10.6

1894.3	S.f.	2″. ±	Innes	2 n

Another *comes* 11.5 about 20″ S.f., and another at 25″.
N.pr. N Velorum, an orange-red star, by about 6′.

No. 42. β 910. Lal. 18,798. 7.0
9h 28m 7s — 13° 33′.5.

Comes = 10.0

1879.9	304°.9	6″.84	β	3 n
1892.1	305.9	6.68	,,	3
1893.2	305.0	6.33	Haverford	2

No change.
A 9.2 mag. star is a little N.pr.

No. 43. h. 4218. C. Z. 9 h. 2261. 7.7
9h 29m 2s — 35° 57′.6.

Comes = 10.8

1836.2	29°.7	3″.5 ±	*h*	2 n
1879.4	26.9	5.46	Hargrave	1
1898.3	28.5	5.72	See	1

No. 44. Russell 122. C. Z. 9 h. 2281. 8.5
9h 29m 5s — 55° 33′.7.

8.9 and 9.4

1873.2	94°.8	3″.20	Russell	1 n

A coarse faint triple, Russell 121, is in the same field 3′ S.

No. 45. Innes 289. Lac. 3957. 8.2.
9h 29m 17s — 73° 12′.5.

8.4 and 9.9

1898.1	240°. ±	0″.9 ±	Innes	1 n

No. 46. Innes 200. Lac. 3924. 7.7
9h 29m 22s — 60° 47′.5.

7.9 and 9.9

1897.5	355°. ±	1″. ±	Innes	1 n

No. 38. Misidentification. This pair is Lac. 3833, mag. 6.0; 9h 22m 23s,—28° 21′.2, mags. 6.4 and 7.2.
No. 40. Cape, 1899.1, 290° ±; direct motion.

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No. 47. h. 4220. Lac. 3917. MAG. 5.3
9h 30m 9s — 48° 33′.7.

5.8 and 6.4

1836.1	202.°0	2.″99	*h*	3 n
1846.2	201.5	2.70	Jacob	2
1851.2	203.4	2.47	,,	2
1872.2	202.9	.....	Russell	1
1877.3	204.8	2.64	Melbourne	2
1880.8	204.8	1.58	Hargrave	2
1897.1	204.0	2.41	See	3

The p.m. is very small.

No. 48. Russell 123. Lac. 3930. 7.7
9h 30m 18s — 57° 31′.1.

8.4 and 8.5

1873.2	30.°1	2.″53	Russell	1 n
1897.1	26.0	1.68	See	2

The f. star of a small triangle.
Also seen at Cordoba.

No. 49. Innes 201. Lac. 3970. 8.2
9h 30m 52s — 73° 18′.3.

8.4 and 10.2

1897.4	155.°±	1.″8	Innes	2 n

The f. and brightest of three stars.
H Carinæ, mag. 5.5, is 40′ N.
No. 45 is N.pr.

No. 50. h. 4224. Lac. 3926. 7.8
9h 31m 44s — 30° 47′.1.

8.1 and 9.2

1836.1	118.°9	4.″±	*h*	1 n
1876.1	116.6	7.33	Cinc.	1

Separately observed on the meridian at Cordoba.
The p.m. of this star may be considerable.

No. 51. Russell 125. Lac. 3950. MAG. 6.7
9h 32m 48s — 48° 18′.1.

6.8 and 9.4

1880.3	165.°0	2.″77	Russell	2 n
1882.4	170.0	3.06	Hargrave	1
1897.1	166.9	3.12	Lowell	4

The measures for 1880.3 are taken from the Sydney list, which here differs from the list in the *Mem. R. A. S.*, vol. xlvii.
This star appears in the Harvard list of new double stars—Circular, No. 18.
No. 47 is S.pr.

No. 52. λ 115. Lac. 3961. 5.5
9h 33m 52s — 53° 13′.0.

6.2 and 6.3

1897.2	184.°±	0.″25	See	2 n

No. 53. Innes 202. Lac. 3959. 7.0
9h 34m 38s — 39° 9′.6.

Comes = 10.0

1897.3	179.°±	1.″±	Innes	1 n

Bris. 2587, mag. 7.6, is N.f.

No. 54. Cincinnati. B.D.—16°, 2851. 8.3
9h 35m 18s — 16° 42′.2.

8.5 and 10.0

1882.1	266.°0	3.″04	Cinc.	1 n
1884.2	265.3	3.05	,,	2

An 8.8 mag. star 5′.8 S.f.

No. 55. Howe 11. C. Z. 9 h. 2728. 8.3
9h 35m 35s — 32° 28′.0.

Comes = 11.3

1877.1	17.7	5.16	Cinc.	1 n
1885.7	16.3	5.12	,,	2

A 9th mag. star 7 secs. pr. 1′ S.
Many stars in the field.

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No. 56. Innes 203. C. Z. 9 h. 2785. MAG. 8.2
$9^h\ 35^m\ 49^s$ — 62° 6′.2.

8.6 and 9.6

1897.4	140.° ±	0.″5 ±	Innes	1 n

C. Z. 9 h. 2831, mag. 7.5, is 42 secs. f., and both precede the well-known variable star *l* Carinæ.

No. 57. β 214. Lal. 19,064. 7.7
$9^h\ 36^m\ 48^s$ — 18° 1′.5.

7.8 and 10.7

1874.2	263.°9	2.″5 ±	β	1 n
1875.3	261.0	3.09	Dembowski	2
1877.1	259.0	2.88	Cinc.	2
1886.3	261.3	[3.21]	L. McC.	1

An 8.5 mag. star 53 secs. pr.

No. 58. Russell 129. Lac. 4000. 7.4
$9^h\ 39^m\ 27^s$ — 55° 22′.6.

7.9 and 8.5

1873.2	106.°5	4.″12	Russell	1 n

Also seen at the Cape in 1875, and at Cordoba in 1876.

No. 59. λ 116. Ō.A. 10,099. 8.6
$9^h\ 41^m\ 44^s$ — 28° 6′.6.

8.7 and 11.4

1897.9	200.°3	2.″86	See	1 n

No. 60. Hargrave 28. Gilliss 1140. 7.8
$9^h\ 42^m\ 12^s$ — 59° 0′.8.

8.0 orange, and 9.6

1882.4	280.° ±	2.″ ±	Hargrave	1 n
1897.5	290.° ±	2.5 ±	Innes	1

The Dec. given with the first observation is 6′ in error.

No. 61. Innes 172. Lac. 4025. 7.7
$9^h\ 43^m\ 18^s$ — 37° 15′.6.

7.9 and 10.0

1897.2	310.° ±	0.″9 ±	Innes	2 n

No. 62. Washburn 99. C. Z. 9 h. 3281. MAG. 7.6
$9^h\ 43^m\ 22^s$ — 27° 8′.1.

7.8 and 9.8

1888.9	218.°1	1.″75	Washburn	3 n

No. 63. Innes 204. Lac. 4054. 7.2
$9^h\ 43^m\ 56^s$ — 69° 39′.3.

7.5 and 8.8

1897.4	120.° ±	1.″ ±	Innes	1 n

No. 64. Innes 205. Lac. (4026). 7.0
$9^h\ 44^m\ 13^s$ — 25° 57′.0.

7.1 yellow, and 10.1 blue

1897.5	20.° ±	2.″ ±	Innes	1 n

No. 65. h. 4249. Lac. 4031. 7.5
$9^h\ 44^m\ 29^s$ — 34° 33′.3.

Both = 8.3

1836.3	125.°2	4.″93	*h*	3 n
1848.1	125.2	4.28	Jacob	1
1877.1	122.6	4.45	Cinc.	1
1879.3	126.0	4.03	Hargrave	1
1881.2	126.5	5.61	Tebbutt	1

Other measures.
Fixed.

No. 66. h. 4252. ν Argûs. 3.0 Orange
$9^h\ 44^m\ 36^s$ — 64° 36′.5.

Comes = 7.0 blue

1836.8	126.°1	4.″90	*h*	3 n
1850.1	124.9	5.58	Maclear	1
1854.1	126.1	4.94	,,	1
1875.9	124.9	5.04	Russell	2
1877.4	127.7	4.98	Melbourne	2
1880.3	125.4	4.94	Tebbutt	1

A very pretty pair, and evidently fixed.
The p.m. is only 0.″027 towards 293°.7.
C. P. D. mag. = 4.6.

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No. 67. Cordoba [22]. Bris. 2697. MAG. 8.6
9h 46m 18s — 62° 33′.3.

8.7 and 10.0

1879.3	S.f.	3″.±	C. G. A.	3 n
1883.4	117.1	4.23	Hargrave	1

No. 68. Alvan Clark 5. γ Sextantis. 5.3
9h 47m 33s — 7° 38′.0.

6.0 and 6.3

1854.2	50°.6	0″.55	Dawes	2 n
1867.1	90.2	.....	Harvard	1
1870.3	22.4	.....	,,	2
1886.2	130.4*	0.40	Cinc.	2
1886.3	158.5	0.28	Hall	1
1888.1	133.1	0.4 ±	Haverford	1
1889.2	125.6	0.54	β	3
1892.2	105.3	0.41	,,	4
1896.9	93.6	0.42	Aitken	3
1897.9	91.0	0.39	,,	3

Found in 1852 with a 4¾-inch refractor.

Binary. Prof. v. Glasenapp finds a period of 93.9 years.

The motion is retrograde.

Small p.m.

Another star measured by β in 1880, about 36″ distance, is probably equal to H. N. 49.

See :—

1892. Glasenapp, S. v., "Orbit.," *Astr. Nach.*, No. 3119.

1886. Wilson, H. C., "Motion," *Sidereal Messenger*, vol. v. p. 125.

No. 69. β 215. Lac. 4058. 7.0
9h 49m 35s — 27° 31′.6.

7.1 and 10.0

1877.1	337°.8	1″.78	Cinc.	1 n
1884.2	345.2	1.88	,,	2
1893.3	341.3	1.52	Sellors	2–1

Two stars, 9.3 and 9.0, are f.

No. 70. β 592. Ö.A. 10,209. 7.2
9h 50m 13s — 15° 43′.3.

Comes = 12.0

1879.8	191°.6	9″.86	β	3 n

Also measured at Cincinnati on 1 n. in 1879.

No. 71. Dunlop 81. Piazzi 9 h. 213. MAG. 5.8
9h 50m 21s — 44° 48′.6.

Comes = 9.2

1835.2	239°.1	6″.15	*h*	3 n
1847.5	240.5	5.50	Jacob	3
1879.4	235.6	5.01	Hargrave	1
1897.1	238.6	5.55	Lowell	5

The p.m. is very small.

No. 72. β 216. Lac. 4074. 6.1
9h 52m 15s — 26° 4′.5.

Comes = 10.5

1877.2	162°.4	3″.03	Cinc.	1 n
1879.3	162.3	2.52	,,	1

Seen in 1897.

No. 73. Rumker 12. Lac. 4102. 6.7
9h 53m 1s — 68° 42′.9.

7.0 and 8.2

1834.6	210°.0	12″. ±	*h*	2 n
1879.4	213.2	8.78	Hargrave	1

Erroneously called *h* 4269 in the Sydney Observatory list.

No. 74. Innes 290. Cape 1880, 5446. 9.2
9h 58m 45s — 59° 35′.7.

9.8 and 10.2

1898.3	290°. ±	1″. ±	Innes	1 n

Bris. 2802, mag. 8.2, is 16 secs. pr. and 2′ S.

In a cluster.

No. 75. Innes 291. Lac. 4154. 7.2
9h 59m 20s — 70° 14′.8.

7.4 and 9.5

1898.3	340°. ±	1″.5 ±	Innes	1 n

The p.m. is very small.

No. 76. Innes 292. Lac. 4128. 7.3
9h 59m 46s — 27° 53′.6.

8.0 and 8.1

1898.3	230°. ±	0″.8 ±	Innes	1 n

The scanty material available indicates a small p.m. in R.A.

In a low power field with another double star.

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No. 1. Hargrave 47. Lac. 4153. MAG. 6.7
10h 0m 29s — 61° 24′.0.

7.0 and 8.4

1883.4	351°.2	0″.63	Hargrave	1 n
1893.3	351.7	0.88	Sellors	1

Lac. 4148, mag. 6.9, orange, is S.pr.

No. 2. Innes 293. Lac. 4134. 6.9 Yellow
10h 0m 40s — 27° 42′.7.

7.3 and 8.3

1898.3	320°. ±	0″.5 ±	Innes	1 n

The p.m. is very small. The f. and slightly fainter of two stars.

Another and easier pair is S.pr.

No. 3. h. 4283. Lac. 4147. 7.8
10h 0m 43s — 51° 18′.8.

Cape 1880, 5471 = 8.6

1836.2	181°.0	7″.26	*h*	2 n
1848.1	181.2	8.29	Jacob	1
1872.2	178.2	8.16	Russell	2

Both components white.

No. 4. h. 4284. Lac. 4146. 7.4 Yellow
10h 1m 5s — 45° 24′.6.

C. G. A. 13,769 = 8.8

1837.1	73°.2	10″. ±	*h*	1 n
1897.1	78.0	6.93	See	1

No. 5. Hough 371. Lac. 4143. 6.8
10h 1m 17s — 30° 24′.3.

Comes = 12.3

1891.8	40°.6	6″.38	Hough	2 n
1898.3	43.4	6.23	See	1

No. 6. Harvard 125. W.B. 9 h. 1272. 8.4
10h 1m 49s — 1° 14′.3.

9.1 and 9.2

1880.7	171°.8*	1″.94	β	2 n
1888.2	171.5	2.01	Haverford	3

Discovered in 1868 but not measured.

No. 7. H. C. Wilson. C. Z. 10 h. 52. MAG. 8.0
10h 1m 55s — 28° 9′.8.

8.7 and 8.8

1882.2	217°.2	1″.44	Cinc.	1 n
1885.2	217.1	1.00	,,	1

No. 8. β 217. Bonn 9 h. 146. 7.3
10h 2m 13s — 24° 13′.6.

7.9 and 8.2

1868.2	276°.0	1″.66	Harvard	1 n
1876.1	274.6	1.90	Cinc.	4
1882.2	274.6	2.03	,,	4–2
1889.2	277.2*	1.58	Haverford	2–1
1893.3	279.8	1.76	Sellors	2

Noted as a double star at Cordoba, also = Harvard 126.

No. 9. Innes 173. Lac. (4158). 5.2
10h 2m 14s — 46° 52′.9.

5.4 and 7.0 both yellow

1897.1	45°. ±	0″.6 ±	Innes	1 n

There are too few meridian observations to give a p.m.

No. 10. β 218. Lal. 19,765. 7.2
10h 2m 38s — 19° 13′.3.

7.9 and 8.0

1875.3	122°.6	0″.99	Dembowski	4 n
1877.1	120.5	0.97	Cinc.	2
1888.1	120.1	0.91	Haverford	2
1892.1	124.4	0.91	β	3

Other measures.

"The pr. star of a small equilateral triangle."—β.

β 911 is 1m f. 2′ S.

No. 11. β 911. Lal. 19,780. 7.2
10h 3m 38s — 19° 15′.4.

Comes = 10.8

1880.2	311°.5	4″.75	β	2 n
1892.1	313.4	4.77	,,	3

Common p.m. of 0″.364 towards 195°.8.

There is a third star = C. P. D.—19°, 4515, mag. 9.6, 50″ away, which does not share in the p.m.

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No. 12. β 790. W.B. 10 h. 26. MAG. 8.8
$10^h\ 5^m\ 4^s$ — 12° 23′.1.

9.1 and 10.5

1881.4	69.°7	2.″17	β	3 n
1888.7	70.0	2.18	Washburn	4–3
1889.0	67.2	2.13	Haverford	4–3

A 5.3 mag. star is 10 secs. f. 4′ N.

No. 13. Hough 44. 1st Munich 4995. 8.6
$10^h\ 6^m\ 28^s$ — 5° 41′.0

Both 9.4

1884.3	10.°9	0.″41	Hough	2–1 n

No. 14. Innes 13. Lac. 4203. 6.4
$10^h\ 7^m\ 2^s$ — 68° 11′.5.

7.1 and 7.2, both white

1896.3	330.°±	1.″±	Innes	3 n

A 10.5 star is 30″ ± N.f., and with Lac. 4203, makes the old pair h 4295.

No. 15. Σ 1416. Lal. 19,868. 8.0
$10^h\ 7^m\ 27^s$ — 15° 35′.5.

8.4 and 9.4

1827.7	275.°8	11.″3	Σ	2 n
1868.0	276.9	11.3	Dembowski	4
1880.9	276.2	11.6	β	3

The chief star has been suspected of variability, 6.7 to 9.0, period about 50 years.

No. 16. Sellors 17. Lac. 4225. 7.7
$10^h\ 10^m\ 1^s$ — 64° 40′.3.

Comes = 12.3

1895.4	338.°5	3.″15	Sellors	3 n

No. 17. Howe 13. C. Z. 10 h. 686. 8.3
$10^h\ 10^m\ 17^s$ — 36° 9′.2.

8.8 and 9.3

1877.3	300.°8	2.″95	Cinc.	1 n
1885.2	306.6	3.36	,,	1

Also noted as a double star at Cordoba.

A fainter and wider pair, Howe 12, is 4^m pr. a little N.

No. 18. h. 4310. Lac. 4297. MAG. 7.3
$10^h\ 10^m\ 21^s$ — 83° 35′.8.

7.8 and 8.3, both yellow

1837.2	279.°2	3.″±	h	1 n
1871.2	273.8	3.90	Russell	1
1881.4	270.4	2.99	Hargrave	1

Some change shewn.

No. 19. Washburn 100. B.D.—17°, 3100. 8.9
$10^h\ 10^m\ 55^s$ — 17° 55′.4.

9.2 and 10.5

1888.9	199.°6	1.″43	Washburn	3 n

No. 20. Washburn 101. Lal. 19,986. 6.6
$10^h\ 12^m\ 1^s$ — 20° 10′.2.

6.7 and 9.8

1888.7	113.°8	1.″49	Washburn	2 n
1898.3	115.0	1.42	See	1

No. 21. Russell 139. Lac. 4248. 7.2
$10^h\ 12^m\ 20^s$ — 66° 47′.3.

7.4 and 9.2, both yellow

1880.5	331.°7	2.″75	Russell	1 n

C. P. D. mag. = 8.5.

No material for a determination of p.m.

C. Z. 10 h. 864, mag. 8.7, is somewhat S.pr.

No. 22. Innes 206. Lal. 20,048. 8.5
$10^h\ 14^m\ 23^s$ — 22° 39′.7.

9.0 and 9.5

1897.4	320.°±	0.″9 ±	Innes	1 n

Lal. 20,040, mag. 7.5, is 16 secs. pr.

No. 23. Innes 207. C. Z. 10 h. 989. 8.5
$10^h\ 14^m\ 27^s$ — 32° 42′.8.

9.0 and 9.5

1897.4	330.°±	2.″±	Innes	2 n

The N.f. and brightest star of a small triangle.

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No. 24. Washburn 102. Porter 1870. MAG. 9.0
10h 15m 11s — 20° 50′.5.

9.4 and 10.4

1888.9	173°.3	1″.34	Washburn	3 n

No. 25. Russell 140. Bris. 2946. 7.6
10h 15m 21s — 55° 31′.2.

8.0 and 9.0

1877.3	279°.7	4″.46	C. G. A.	5 n
1881.5	277.1	2.88	Russell	1
1897.1	282.7	3.19	See	3

No. 26. Washburn 103. 1st Munich 5180. 8.0
10h 15m 45s — 15° 50′.8.

8.5 and 9.2

1888.6	336°.9	1″.58	Washburn	3 n

No. 27. h. 4306. Lac. 4268. 6.3
10h 15m 59s — 64° 10′.5.

Both = 7.1, yellow

1836.7	139°.3	1″.34	*h*	3 n
1873.2	137.8	2.88	Russell	1
1886.2	137.8	2.19	Tebbutt	2

No. 28. Schjellerup, 16. W.B. 10 h. 242. 7.7
10h 16m 46s — 9° 16′.1.

8.2 and 8.7

1867.1	187°.9	0″.9 ±	Harvard	1 n
1872.8	185.1	1.81	Dunér	2
1875.2	180.5	1.76	Dembowski	4
1878.2	179.6	1.66	Cinc.	2
1888.2	177.8	1.86	Haverford	3–2

Found in 1863.
Also registered as β 25.
Some change.

No. 29. β 219. U.A. 214 Hydrae. MAG. 6.7
10h 16m 52s — 22° 1′.5.

6.9 and 8.6

1876.1	188°.6	2″.33	Cinc.	3 n
1892.2	188.1	2.14	Haverford	4
1892.3	186.4	2.07	β	3

A wide pair, *h* 4303, is about 4′ S.pr.

No. 30. Russell 141. Lac. 4280. 7.7
10h 17m 11s — 66° 39′.9.

8.1 and 9.1

1880.3	37°.1	2″.93	Russell	1 n

The co-ordinates published with the above measure are considerably in error.

No. 31. Rumker 13. J Velorum. 5.0
10h 17m 11s — 55° 32′.4.

Comes = 9.0

1836.9	103°.5	7″.04	*h*	2 n
1848.1	103.4	7.26	Jacob	1
1887.2	102.9	6.97	Pollock	1
1897.1	105.2	7.20	See	2

Also known as T Velorum.
The p.m. is insensible.
Another star, 9.0 mag., Gilliss 1242, is 37″ S.pr.

No. 32. β 912. W.B. 10 h. 253. 8.7
10h 17m 25s — 13° 10′.3.

Comes = 12.0

1879.2	106°.3	0″.95	β	2 n
1880.2	101.4	1. ±	Cinc.	1

No. 33. h. 4311. Lal. 20,158. 6.8
10h 18m 24s — 12° 52′.2.

Comes = 10.4

1836.2	122°.3	4″. ±	*h*	1 n
1868.8	126.6	3.69	Harvard	2–1
1877.7	126.8	3.98	Cinc.	2
1886.1	126.0	3.92	L. McC.	2

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No. 34. Washburn 105. Ö.A. 10,588. MAG. 8.8
10h 18m 58s — 19° 24′.6.

9.2 and 10.2

1888.9	116.6	0.91	Washburn	3 n

No. 35. Cordoba [23]. C. Z. 10 h. 1352. 7.8
10h 19m 8s — 65° 11′.2.

8.0 and 10.0

1897.	170.° ±	4.″ ±	Innes	1 n

See also rejected stars, Russell 142.

No. 36. Innes 208. Bris. 2987. 7.5
10h 19m 34s — 43° 44′.2.

7.7 and 9.9, both white

1897.3	30.° ±	1.″ ±	Innes	1 n

No. 37. Innes 209. C. Z. 10 h. 1393. 7.5
10h 20m 2s — 38° 4′.3.

8.1 and 8.5

1897.4	140.° ±	1.″ ±	Innes	1 n

Followed at 57 secs. 5½′ S. by C. Z. 10 h. 1467, mag. 9.4, and C. Z. 10 h. 1475, mag. 8.7.

No. 38. Innes 210. C. Z. 10 h. 1612. 7.7
10h 23m 24s — 38° 11′.5.

7.8 and 10.3

1897.4	250.° ±	1.″ ±	Innes	1 n

C. Z. 10 h. 1613, mag. 9.0, is closely N.f.

No. 39. Innes 73. Lac. 4315. 7.2
10h 24m 52s — 48° 28′.6.

Comes = 10.0

1896.5	S.pr.	3.″ ±	Innes	1 n
1897.2	218.°0	5.27	See	1

Another *comes*, 10.5 mag., is 20′ N.f.
Cape 1880, 5741, mag. 7.8, is 8 secs. f. 3′ N.

No. 40. H. N. 50. MAG. 5.8
δ Antliae.
10h 24m 59s — 30° 5′.7.

Comes = 9.2

1787.2	230.° ±	.....	H	1 n
1856.2	226.7	10.9	Jacob	3
1877.1	226.7	10.7	Howe	1
1890.2	226.0	10.7	Washburn	1
1897.3	226.2	11.3	See	2

The p.m. is very small.
Also registered as *h* 4321.
Other measures.

No. 41. Russell 149. C. Z. 10 h. 1819. 8.6
10h 25m 43s — 66° 11′.1.

9.2 red, and 10.0

1880.2	127.°6	3.″77	C. G. A.	3 n
1880.3	134.4	4.20	Russell	1
1883.3	137.0	3.21	Hargrave	1

The Dec. given in the *Sydney Catalogue* is erroneous.

No. 42. Σ 1441. Bradley 1462. 6.4
10h 25m 58s — 7° 7′.4.

Comes = 9.9

1830.1	169.°3	2.″59	Σ	7 n
1858.3	168.0	3.13	Morton	1
1867.2	166.4	2.77	Dembowski	3
1878.8	167.7	2.41	Cinc.	2

Common p.m. of about 0″.08.

No. 43. β 1073. Lal. 20,428. 7.2
10h 27m 27s — 5° 33′.5.

Comes = 11.7

1889.3	46.°9	3.″02	β	3 n

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No. 44. h. 4329. Lac. 4336. MAG. 5.1 White
10h 27m 28s — 53° 12′.4.

Cape 1880, 5768 = 7.9 red.

1837.1	17.°4	17.″5	*h*	2 n
1881.5	71.7	23.4	Hargrave	1

The chief star was formerly called Y Velorum.

The change is due to the p.m. of the chief star, viz., 0″.44 towards 297°.5.

See :—

1895. Innes, R. T. A. "Proper Motion," *M. N. R. A. S.*, vol. lvi. p. 72.

No. 45. Innes 174. C. Z. 10 h. 1936. 8.4
10h 27m 34s — 61° 3′.8.

8.8 and 9.7

1897.1	70.°±	0.″7 ±	Innes	1 n

Closely S.pr., a coarse double star.

No. 46. Σ 1445. Göttingen 3475. 8.4
10h 27m 36s — 0° 21′.0.

8.6 and 10.7

1827.6	167.°4	2.″42	Σ	3 n
1864.9	159.4	2.95	Dembowski	3
1880.1	161.7	2.81	*β*	3
1880.5	162.0	2.58	Pritchett	4

The first angle seems 10° too large.

No. 47. Innes 33. C.P.D.—60°, 1950. 9.3
10h 27m 41s — 61° 2′.8.

Comes = 10.4

1895.3	S.f.	3.″±	Innes	1 n

N.f. C. Z. 10 h. 1927, mag. 8.0, and C. Z. 10 h. 1936, mag. 8.4, the latter double.

No. 48. Piazzi. *s* Velorum. 5.8
10h 27m 41s — 44° 33′.1.

6.4 and 6.7

1836.6	217.°8	13.″8	*h*	4 n
1882.9	218.5	13.1	Tebbutt	3
1897.1	217.9	13.6	See	2

The p.m. is very small.

Also called Dunlop 88.

No. 49. Cape 10. Lac. 4338. MAG. 7.7
10h 27m 50s — 51° 43′.0.

8.1 and 8.9

1881.4	346.°8	1.″87	Russell	1 n
1891.3	349.0	2.±	Sellors	1
1897.2	343.0	1.93	See	2

Discovered independently as Russell 150.

Found at the Cape in 1876, see *Cape Meridian Observations* published in 1879.

No. 50. Russell 151. 1st Melb. 526. 8.0
10h 28m 12s — 68° 23′.0.

8.2 and 9.9

1880.4	191.°7	3.″47	Russell	1 n

Both stars observed on the meridian at Cordoba in 1879.

No. 51. Innes 32. C. P. D.—61°, 1702. 9.0
10h 28m 15s — 61° 16′.8.

Comes = 11.0

1895.3	N.	2.″±	Innes	1 n

About 8′ S.pr. *p* Carinae, mag. 3.6.

No. 52. Washburn 106. Gilliss 1281. 7.5
10h 29m 22s — 54° 51′.9.

8.2 and 8.4, both bluish

1892.3	247.°5	1.″17	Sellors	1 n

Lac. 4350, yellow, mag. 7.1, is about 26″ S.

Several faint stars pr.

No. 53. Washburn 107. B.D.—17°, 3186. 9.4
10h 30m 39s — 17° 25′.1.

9.9 and 10.4

1888.9	309.°0	1.″60	Washburn	3 n

About 39′ N. and a little pr., a 6.6 mag. star.

No. 54. Cordoba [24]. Bris. 3093. 7.4
10h 31m 15s — 57° 9′.6.

Comes = 10.2

1878	S.pr.	6.″	C.G.A.	2 n

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No. 55. β 411. Lac. 4360. MAG. 6.1
10h 31m 21s — 26° 9′.3.

6.3 and 7.9

1877.3	295°.0	1″.36	Cinc.	1 n
1879.3	294.2	1.31	,,	1
1892.3	290.6	1.29	Haverford	4
1892.3	288.3	1.08	β	3
1893.3	287.7	1.00	Sellors	2
1898.2	279.9	0.87	See	1

Angle and distance decreasing.

No. 56. β 1075. Bradley 1474. 6.3
10h 31m 24s — 15° 49′.6.

Comes = 13.2

1889.1	277°.1	3″.03	β	3 n

The chief star has also been called ϕ_2 or ϕ_3 Hydrae.

No. 57. Innes 74. Bris. 3103. 8.5
10h 31m 33s — 63° 36′.7.

8.7 and 10.3

1896.3	S.pr.	2″.±	Innes	1 n

With Lac. 4376, mag. 8.0, about 30″ S.pr., this makes up the old pair Dunlop 93.

No. 58. Innes 175. Cape 1880, 5821. 7.7
10h 32m 5s — 47° 19′.9.

Comes = 10.5

1897.1	160°.±	2″.±	Innes	1 n

Cape 1880, 5824, mag. 7.8, is closely S.f.

No. 59. λ 119. *p* Velorum. 4.0
10h 33m 6s — 47° 42′.4.

4.5 and 5.0, both yellow

1897.06	268°.9	0″.47	See	3 n
1897.08	261.4	0.66	Cogshall	1

This fine system has a common p.m. of 0″.177 towards 262°.9.

C. P. D. mag. = 5.7.

No. 60. Cordoba. C. Z. 10 h. 2403. MAG. 9.0
10h 34m 10s — 64° 51′.2.

Both = 9.8

1899.2	.....	4″	Innes	1 n

Cordoba has also noted another small pair in this field. It is 20′ N.f. = C. Z. 10 h. 2569, and has been registered as Innes 75 in error.

No. 61. Washburn 108. Ö.A. 10,785. 8.4
10h 34m 16s — 17° 3′.3.

8.8 and 9.8

1888.6	21°.5	1″.04	Washburn	3 n
1892.8	24.7	0.68	Hough	2

Also registered as Hough 373.

Ö.A. 10,784, mag. 9.1, is 49″ S.pr.

No. 62. Dunlop 94. t_2 Carinæ. 4.7 Yellow
10h 34m 57s — 58° 39′.7.

Comes = 7.5 blue

1836.7	21°.4	15″.2	*h*	2 n
1851.3	20.5	15.0	Jacob	2
1871.4	20.0	14.7	Russell	2
1897.1	19.0	15.2	See	2

The p.m. of the chief star is 0″.02 towards 180°.

Lac. 4401, mag. 6.8, is 22′ N.f. and has a *comes* 9th mag. 19″ away, first noted by Gilliss, but also registered as Russell 153. On the Cape Photo Plates another but very much fainter *comes* is seen in the opposite direction.

No. 63. h. 4339. Anon. 10.7
10h 35m 14s — 12° 52′.8.

Both = 11.5

1830.4	89°.3	3″.±	*h*	1 n

Included on account of proximity to 1st Munich 5602, an 8.6 mag star (30″ S.pr.).

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No. 64. Russell 152. Lac. 4409. MAG. 7.5
10h 35m 22s — 63° 58′.6.

7.9 and 9.0

1874.3	6.°8	3.″02	Russell	1 n

h 4343, two 10th mag. stars 3″ apart, is near this pair.

No. 65. Harvard 128. Lal. 20,639 9.0
10h 35m 59s — 12° 34′.3.

9.3 and 10.6

1869.7	257.°4	4.″03	Harvard	2 n

Lal. 20,640, mag. 8.0, is closely S.f.

No. 66. Cordoba [25]. C. Z. 10 h. 2704. 8.5
10h 38m 10s — 44° 44′.2.

9.0 and 9.5

1898.2	230.° ±	2.″ ±	Innes	1 n

The brightest of a small group.

No. 67. Washburn 109. Ö.A. 10,830. 9.1
10h 38m 19s — 20° 30′.1.

9.8 and 9.9

1888.9	141.°8	1.″86	Washburn	3 n
1898.3	141.7	2.40	See	1

No. 68. Russell 154. C. Z. 10 h. 2821. 9.0
10h 39m 42s — 63° 39′.7.

9.6 and 9.9

1880.4	305.°6	2.″82	Russell	2 n

No. 69. h. 4356. Lac. 4449. 7.2
10h 40m 5s — 59° 1′.4.

7.4 yellow, and 10.4 bluish

1836.7	148.°6	2.″3 ±	*h*	3 n
1879.4	145.5	2.19	Hargrave	1
1897.2	149.1	2.83	See	3

Separately observed on the meridian at Cordoba.

In the cluster of stars in the great nebula around *η* Argûs.

Measures of many wide or faint pairs in this neighbourhood will be found in *h*'s Cape Observations, and more recently Prof. T. J. J. See has measured eighteen objects—see *Monthly Notices R. A. S.*, vol. lvii. No. 7, May 1897.

All the pairs in this region are relatively fixed.

No. 70. h. 4360. Taylor 4852. MAG 8.3
10h 40m 17s — 59° 3′.1.

9.0 and 9.1

1835.7	117.°2	2.″24		3 n
1871.2	118.2	1.95	Russell	1
1879.4	114.0	1.58	Hargrave	1
1897.2	119.0	1.78	See	3

Bris. 3190, mag. 8.4, is 14″ f.

On some of the plates taken at this Observatory the three stars can be clearly distinguished.

No. 71. β 914. Lal. 20,750. 8.0
10h 40m 45s — 10° 20′.4.

Comes = 12.0

1880.3	338.°6	1.″30	*β*	2 n

No. 72. Washburn 110. Ö.A. 10,860. 8.8
10h 40m 59s — 19° 10′.9.

9.2 and 10.2

1888.3	274.°6	2.″05	Washburn	3 n

Ö.A. 10,863, mag. 8.4, is closely N.f., and Lal. 20,776, mag. 7.0, is S.f.

No. 73. Σ 1470. Lal. 20,756. 8.5
10h 41m 10s — 5° 14′.1.

9.1 and 9.4

1833.0	6.°2	1.″38	Σ	4 n
1868.0	6.2	1.18	Dembowski	4–2
1884.2	10.9	1.19	Cinc.	1
1893.3	15.1	1.37	Glasenapp	2–1

The angle is increasing.

Other measures.

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No. 74. Russell 155. μ Argûs. MAG. 2.8 Yellow
$10^h\ 42^m\ 28^s$ — 48° 53′.5.

Comes = 7.3 green

1880.3	54°.6	2″.81	Russell	1 n
1889.3	57.7	2.48	Pollock	3
1891.3	54.6	2.5 ±	Sellors	1
1897.1	62.8	2.15	Lowell	4

A most beautiful pair and not too difficult for moderate telescopes, the counterpart of ϵ Bootis, and like most highly coloured pairs, practically fixed.

Common p.m. of 0″.074 towards 135°.9.

Thought to be a new pair when first measured by Prof. See.

No. 75. β 595. B.D.—14°, 3190. 8.5
$10^h\ 43^m\ 8^s$ — 14° 25′.9.

8.7 and 10.5

1878.7	16°.2	2″.16	β	2 n
1880.3	18.1	1.95	Pritchett	2
1885.0	13.0	1.95	Cinc.	4–3

Near Lal. 20,804, mag. 7.2. H. II. 7.4 = Σ 1474, a coarse triple star, is about 18′ S.pr.

No. 76. Σ 1476. 40 Sextantis. 6.7
$10^h\ 44^m\ 13^s$ — 3° 29′.7.

7.1 and 8.1

1831.0	351°.9	2″.27	h	1 n
1832.6	353.7	1.89	Σ	3
1859.2	356.8	1.88	Morton	2
1868.8	357.4	1.94	Dembowski	4
1871.3	358.1	2.27	OΣ	1
1875.3	359.1	2.57	Temple Obs.	2
1886.3	1.2	1.93	Cinc.	1
1888.7	359.3	2.29	Haverford	4
1893.3	1.6	2.02	Glasenapp	2–1
1893.4	6.6	1.98	Lewis	1

Small common p.m.

Slow increase in angle.

Other measures.

No. 77. Innes 294. δ_1 Chameleontis. MAG. 5.5
$10^h\ 44^m\ 19^s$ — 79° 56′.4.

6.2 and 6.4, both yellow

1898.1	240°. ±	0″.6 ±	Innes	2 n

δ_2 Chameleontis, mag. 4.6, white, is 5′ S.f.

The p.m. of δ_1 is

R.A. = −0°.02 Dec. = −0″.04.

No. 78. h. 4373. Cor. D.M.—40°, 6313. 8.9
$10^h\ 44^m\ 22^s$ — 40° 54′.8.

8.6 and 9.1

1835.2	226°.1	25″. ±	h	1 n
1879.4	337.0	12.66	Hargrave	1
1882.3	339.1	10.44	,,	1
1892.5	.....	6.01	Tebbutt	1

Rectilinear motion.

Noted as double in the C. P. D.

No. 79. Russell 161. Lac. 4493. 6.7
$10^h\ 45^m\ 27^s$ — 58° 47′.7.

7.1 and 8.1, both yellow

1874.2	256°.0	0″.50	Russell	1 n
1877.2	259.4	0.78	,,	2
1881.2	260.3	1.17	,,	2
1891.4	254.7	0.91	Sellors	1

In the Proceedings of the Royal Society of New South Wales for 1880 some of the above measures are given, but they differ somewhat from the above figures.

Bris. 3241, mag. 8.5, is N.f.

No. 80. β 111. B.D.—8°, 3023. 9.0
$10^h\ 46^m\ 10^s$ — 8° 33′.9.

9.7 and 9.9

1875.2	3°.3	3″.32	Dembowski	3 n
1880.7	6.3	3.59	β	2
1881.3	6.2	3.51	Pritchett	1
1886.3	3.3	3.54	L. McC.	1
1888.2	5.4	3.51	Haverford	5

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No. 81. λ 125. C. Z. 10 h. 3370. MAG. 10.0
10h 47m 18s — 44° 33′.4.

10.7 and 10.8

1897.2	198.°8	1.″80	See	1 n

No. 82. Hargrave 53. C. Z. 10 h. 3447. 8.0
10h 48m 21s — 58° 12′.9.

8.2 and 10.2

1880.3	217.°5	3.″78	C. G. A.	4 n
1883.4	216.8	4.06	Hargrave	1
1897.2	218.1	3.59	See	1

No. 83. h. 4383. Lac. 4531. 6.1
10h 50m 25s — 70° 11′.3.

6.5 and 7.3

1837.2	285.°8	1.″42	*h*	1 n
1872.3	277.4	1.42	Russell	2
1877.3	281.7	1.70	Melbourne	1
1879.4	283.1	1.15	Hargrave	1
1892.4	281.2	1.21	Sellors	2

The p.m. is very small.

No. 84. Innes 306. C. Z. 10 h. 3650. 9.0
10h 51m 27s — 47° 2′.5.

9.5 and 10.0

1898.4	100.°±	0.″9±	Innes	1 n

Combined mag. in C. P. D. = 8.1 is probably more correct.

No. 85. Hargrave 54. Gilliss P.Z. 7456. 8.8
10h 52m 16s — 72° 56′.6.

Both = 9.6

1883.4	282.°3	1.″52	Hargrave	1 n

[Note added 1899.3]. This should be C. Z. 10 h. 3559, mag. 9.0. R. A. = 10h 49m 36s. Dec. = − 73° 2′.2. The components are 9.5 and 10.0 mag.

No. 86. Howe 14. C. Z. 10 h. 3781. MAG. 8.5
10h 53m 10s — 35° 6′.4.

Comes = 9.9

1876.3	160.°±	6.″±	Howe	1 n
1897.4	150.1	9.30	See	1

The pr. star of a triangle.

No. 87. h. 4393. Lac. 4548. 6.8
10h 53m 49s — 68° 30′.2.

7.0 and 9.1

1835.3	131.°0	7.″10	*h*	1 n
1879.4	130.8	8.30	Hargrave	2

Separately observed at Cordoba.

No. 88. Innes 211. Piazzi 10 h. 208. 5.8
10h 54m 30s — 33° 12′.0.

5.9 and 9.2

1897.3	177.°±	1.″5±	Innes	2 n

The p.m. is very small.
A 10.5 mag. is S.f.

No. 89. Σ 1500. Lal. 21,116. 7.3
10h 54m 56s — 2° 56′.2.

7.8 and 8.4

1825.2	330.°9	1.″06	Σ	2 n
1832.1	321.5	0.97	,,	4
1856.3	318.4	1.05	Secchi	3
1871.3	317.3	1.53	OΣ	1
1895.3	313.6	1.53	Comstock	2

Many other measures.
Angle decreasing, but the change has become very slow, only about 7° since 1840.

No. 90. Russell 164. Lac. 4556. 7.0
10h 55m 13s — 60° 47′.1.

Comes = 11.2 white

1873.3	82.°2	4.″52	Russell	1 n

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No. 91. λ 126. Lac. 4551. MAG. 8.0.
10h 55m 38s — 42° 51′.2.

8.4 and 9.1

1897.2	170°.3	0″.72	See	2 n

No. 92. Ḥ. I. 77. Lal. 21,178. 8.0
10h 57m 8s — 15° 9′.2.

8.7 and 8.9, both white

1783.2	7°.6	.....	Ḥ	1 n
1876.1	16.2	2.92	Cinc.	2
1877.3	13.9	2.94	Schiaparelli	1
1888.5	16.5	2.91	Haverford	3

There are other observations, but one observation a century would probably suffice for many pairs of this class.

No. 93. Innes 212. Lac. 4605. MAG. 7.0
10h 58m 5s — 81° 1′.3.

7.7 and 7.8

1897.8	330°.±	0″.75 ±	Innes	2 n

No. 94. Howe 15. Lac. 4570. 7.3
10h 58m 27s — 26° 58′.7.

7.5 and 8.9

1877.1	330°.8	2″.51	Cinc.	2 n
1885.3	335.2	2.39	„	1
1889.2	332.0	2.15	Haverford	1

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No. 1. Innes 176. C.P.D.—46°, 5097. MAG. **9.0**
11h 1m 6s — 46° 52′.6.

9.1 and 11.0

1897.1	270.° ±	2.″ ±	Innes	1 n

Lac. 4590, mag. 6.8, is 8 secs. f. 2′ S.

In the C. P. D., the combined mag. of the double star is 9.6.

No. 2. h. 4409. Piazzi 10 h. 248. **5.4 Yellowish**
11h 2m 39s — 42° 5′.9.

Comes = 9.1

1837.3	278.°0	1.″40	*h*	2 n
1853.4	276.4	2.24	Jacob	8–2
1879.5	272.7	1.80	Hargrave	1
1897.1	270.0	1.94	See	6

No. 3. Innes 295. C.P.D—60°, 2556. **8.6**
11h 4m 22s — 61° 0′.2.

9.0 and 10.0

1898.1	190.° ±	0.″9 ±	Innes	1 n

A faint star closely pr.

Bris. 3423, mag. 8.0,* is in the field.

No. 4. Innes 213. Piazzi 11 h. 3. **8.0**
11h 5m 47s — 32° 1′.3.

8.2 and 9.7

1897.4	135.° ±	1.″ ±	Innes	1 n

No. 5. β 220. Lal. 21,445. **6.2**
11h 7m 33s — 17° 57′.3.

6.7 and 7.2

1874.3	147.°7	0.″5 ±	β	2 n
1875.3	143.6	0.58	Dembowski	4–2
1877.3	150.8	0.68	Cinc.	1
1878.2	140.0	0.65 ±	,,	1
1880.2	143.8*	0.87	,,	1
1880.3	151.1	0.68	Pritchett	1
1882.4	144.2	0.6 ±	Schiaparelli	2
1884.1	149.1	0.45	Engelmann	5
1887.3	140.3	0.58	Schiaparelli	3
1889.1	136.1	0.71	Haverford	4–2
1893.4	140.3	0.66	,,	2

The angle is probably decreasing.

No. 6. h. 4414. *y* Carinæ. MAG. **4.7**
11h 8m 18s — 59° 46′.4.

Comes = 10.0

1834.2	279.°6	12.″ ±	*h*	1 n
1889.3	275.3	21.7	Pollock	2

No. 7. Innes 231. Lac. 4664. **7.3**
11h 8m 22s — 70° 40′.4.

Comes = 10.0

1897.5	350.° ±	2.″ ±	Innes	1 n

No. 8. Russell 165. C.Z. 11 h. 518. **8.0**
11h 8m 27s — 46° 30′.7.

Both = 8.8

1880.3	59.°5	3.″15	Russell	1 n
1891.3	59.0	2.40	Sellors	1
1897.1	61.7	3.28	See	2

No. 9. β 916. Lal. 21,488. **8.0**
11h 9m 4s — 14° 53′.4.

8.4 and 9.2

1879.1	360.° ±	0.″7 ±	β	1 n
1879.3	357.9	0.7 ±	Cinc.	1
1884.8	362.2	0.65 ±	,,	2
1888.4	357.7	0.64 ±	Haverford	3
1889.2	360.2	0.88	β	3

Seen by Pritchett independently in 1880.

No. 10. λ 128. Lac. 4667. **6.9**
11h 10m 24s — 38° 55′.9.

Both = 7.7

1897.4	208.°1	0.″52	See	1 n

No. 11. h. 4421. Lac. 4675. **6.8**
11h 11m 16s — 47° 22′.5.

Comes = 10.0

1835.2	69.°4	12.″ ±	*h*	1 n

Seen at the Sydney Observatory in 1879.

* Mag. from *C. Zone Catalogue*, the. C. G. A. gives 9.5, which is too faint.

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No. 12. h. 4423. Lac. 4678. MAG. 6.4
11h 11m 49s — 45° 20′.2.

7.0 and 7.3

1836.4	269°.2	1″.28	*h*	3 n
1850.3	275.8	1.73	Jacob	2–1
1853.9	274.1	1.97	,,	3
1877.4	273.9	2.10	Melbourne	1
1879.9	274.0	1.95	Sydney	2
1889.3	275.0	2.16	Pollock	2

Distance increasing?
C. P. D. mag. = 7.7.
Prof See has measured a star at 60°, 33″.

No. 13. β 600. Lal. 21,540. 6.0
11h 11m 54s — 6° 35′.4.

Comes = 12.4

1878.2	226°.4	1″.25	β	1 n
1892.2	216.0	1.23	,,	2

A 9.2 mag. star 1′ S.f. makes, with the chief star, the old pair $\frac{H}{O}$. N. 26, of which the distance is perhaps decreasing :—

1823 67″.
1879 61″.

No. 14. Russell 163. Lac. 4696. 7.1
11h 13m 24s — 58° 39′.7.

7.7 and 8.0

1879.3	55°.2	1″.80	Russell	1 n

The above place, which differs very considerably from that given by Mr Russell (see *Proc. Roy. Soc. of N.S.W.*, 1884), depends upon an identification made here in 1898.
The double star is apparently unchanged.

No. 15. Russell 168. C. Z. 11 h. 1161. 8.2
11h 17m 43s — 42° 24′.6.

8.9 and 9.2

1871.4	305°.6*	3″.20	Russell	1 n
1891.3	309.5*	4.±	Sellors	1
1897.2	309.4	2.63	See	2

Preceding C. Z. 11 h. 1180, mag. 7.8, yellow.
Seen at Cordoba.

No. 16. λ 129. Lac. 4727. MAG. 7.1
11h 17m 55s — 52° 49′.3.

Comes = 11.6

1897.1	4°.1	6″.76	See	2 n

No. 17. λ 130. C. Z. 11 h. 1195. 8.5
11h 18m 11s — 35° 50′.8.

Both = 9.3

1897.4	28°.0	0″.20	See	1 n

No. 18. β 26. Lal. 21,697. 8.2
11h 18m 43s — 9° 52′.4.

8.4 and 10.4

1875.5	70°.4	2″.80	Dembowski	4 n
1879.3	66.7	2.66	Cinc.	2
1886.3	66.2	2.91	L. McC.	1
1888.7	68.7	2.86	Haverford	2

About 30′ N.pr. ε Crateris, mag. 5.0.

No. 19. h. 4432. Lac. 4737. 5.4
11h 19m 2s — 64° 24′.3.

5.6 and 7.4, both yellow

1836.0	288°.5	2″.37	*h*	1 n
1872.3	293.3	2.84	Russell	2
1877.4	292.4	2.34	Melbourne	1
1888.3	298.6	2.23	Tebbutt	1
1889.3	296.6	2.34	Pollock	4–3
1890.4	291.8	2.62	Sellors	1

Probably fixed.
The p.m. is very small.

No. 20. Cape 21. C.P.D.—47°, 5008. 9.1
11h 19m 31s — 47° 25′.4.

Comes = 9.6

1898.3	270°.±	4″.±	Innes	1 n

Discovered by Mr R. T. Pett at the transit circle.

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No. 21. h. 840. γ Crateris. MAG. 4.2
11h 19m 53s — 17° 8′.1.

Comes = 10.5

1829.±	105°.±	3′.±	*h*	1 n
1877.2	98.3	5.14	Cinc.	4

Common p.m. of 0″.133 towards 283°.2.

No. 22. Brisbane. Bris. 3574. 7.8 Red
11h 20m 21s — 61° 6′.1.

8.3 and 8.9

1834.2	292°.2	4″.±	*h*	1 n
1838.1	296.7	6.38	,,	2
1851.3	304.8	4.71	Jacob	2
1854.0	303.7	4.47	,,	2
1857.2	308.8	4.37	,,	3–1
1879.0	329.6	4.32	C. G. A.	4
1883.4	337.9	2.41	Hargrave	1
1896.4	10.1	2.26	Sellors	3

The R. A. given by Mr Hargrave is 5m in error.

Probably a case of rectilinear motion, but the observations do not agree very well. Assuming a p.m. in one of the stars of about 0″.1, the minimum distance of about 2″ would have occurred in 1895.

No. 23. Russell 171. C.P.D.—46°, 5361. 7.9
11h 20m 56s — 46° 56′.2.

8.0 and 11.0

1880.3	350°.9	2″.72	Russell	1 n
1894.4	344.9	2.37	Sellors	1

No. 24. Innes 76. Cor. D.M.—30°, 9211. 9.5
11h 22m 23s — 30° 11′.3.

10.0 and 10.5

1896.3	N.f.	3″.±	Innes	1 n

No. 25. Hargrave 65. Bris. 3589. 8.8
11h 23m 1s — 63° 4′.0.

Both = 9.6

1882.9	261°.1	4″.98	Hargrave	2 n

No. 26. Dunlop 109. Piazzi 11 h. 81. MAG. 5.4
11h 23m 46s — 42° 7′.4.

5.5 and 8.4, both yellow

1835.3	166°.9	12″.9	*h*	2 n
1875.4	167.3	13.3	Sydney	2
1897.2	167.7	13.5	See	3

h suspected that the chief star was double; not confirmed at the Sydney Observatory, where the star is called *h* 4439 erroneously.

The p.m. is inconsiderable.

No. 27. β 601. B.D.—16°, 3258. 8.8
11h 24m 8s — 16° 46′.7.

9.2 and 10.2

1878.8	229°.6	0″.77	β	2 n
1879.7	224.6	0.87	Cinc.	4
1886.2	217.9	.....	L. McC.	1
1886.3	219.9	1.04	Cinc.	1
1888.6	223.2	0.75±	Haverford	2

This pair is 28″ N.pr. the 8.8 mag. star B.D. −16°, 3259, and constitutes with it the old pair ♅. IV. 112.

No. 28. Jacob [7]. Lac. 4757. 5.7
11h 24m 40s — 23° 54′.8.

Comes = 8.0

1847.3	76°.8	8″.06	Jacob	2 n
1868.2	78.5	8.33	Harvard	1
1876.1	78.8	8.81	Cinc.	1
1880.0	78.5	8.38	,,	3

Equal to Harvard 129.

No. 29. h. 4445. o_1 Centauri. 4.9
11h 27m 8s — 58° 53′.4.

Comes = 10.5

1834.7	128°.0	18″.±	*h*	2 n
1896.8	S.f.	10.±	Innes	2

Registered as a new pair = Innes 77 in error.

o_2 Centauri, mag. 5.3, is 5′ S.f., and shares in the small p.m. of o_1.

C. P. D. mags:—o_1 = 7.2; o_2 = 6.4.

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No. 30. H. III. 96. N Hydrae. MAG. 5.0
11h 27m 19s — 28° 42′.9.

5.7 and 5.9

1834.5	209°.9*	6″.±	*h*	1 n
1857.3	211.7	8.82	Morton	2
1878.6	210.1	8.88	Cinc.	2
1893.3	210.4	8.58	Glasenapp	2
1897.1	209.8	8.88	See	2

Stationary with a common p.m. of 0″.182 towards 8°.3.

Also called Dunlop 111.

Other measures.

No. 31. Innes 78. Piazzi 11 h. 105. 5.6
11h 28m 45s — 40° 2′.1.

6.3 and 6.4, both yellowish

1896.8	91°.±	1″.1 ±	Innes	2 n
1897.2	92.6*	1.08	See	1

The duplicity of this star was apparently noted at Arequipa in 1891, as it appears in the list of double stars published in *Harvard Circular*, No. 18, July 1897.

Piazzi 11 h. 101, an orange-coloured star, mag. 6.2, C. P. D. mag. = 7.7, is 49 sec. pr., 9′ N.

No. 32. h. 4455. Bradley 1587. 5.9 Yellow
11h 31m 37s — 33° 0′.9.

6.0 and 9.0

1836.9	244°.9	3″.98	*h*	3 n
1891.3	242.6	3.03	Sellors	1
1893.3	244.4	3.34	Glasenapp	2
1897.4	243.7	3.80	See	4

Also registered as *h* 4463.

Fixed with a common p.m. of 0″.188 towards 69°.7.

The *comes* is called "Crimson" in the G.C.A., but when observed here in 1897 it was blue, the chief star being yellow.

C.P.D. combined mag. = 7.0.

Prof. See measures a faint star at 48″ f.

No. 33. β 456. Lal. 22,020. MAG. 9.0
11h 31m 45s — 11° 47′.6.

9.6 and 9.9

1877.3	248°.2*	0″.65	Hall	2 n
1878.2	257.0	0.65 ±	Cinc.	1
1880.2	255.2	0.7 ±	,,	1
1892.4	274.2	0.46	β	3
1894.8	274.2	0.26	Washburn	2

Some considerable change and interesting on account of the faintness of the stars.

No. 34. Gilliss 165. Cape 1880, 6464. 7.7
11h 31m 54s — 60° 20′.5.

8.0 and 9.2

1883.4	4°.3	1″.67	Hargrave	1 n
1893.4	7.8	1.60	Sellors	1

Also catalogued as Hargrave 69 and Washburn 112.

No. 35. Russell 173. C. Z. 11 h. 2204. 9.0
11h 32m 38s — 46° 23′.2.

9.4 and 10.4

1881.5	149°.8	2″.82	Russell	1 n

No. 36. Σ 1560. Piazzi 11 h. 126. 6.7
11h 33m 18s — 1° 53′.0.

Comes = 10.3

1831.6	280°.6	5″.09	Σ	3 n
1879.0	280.5	5.10	Cinc.	3
1880.2	280.1	5.04	β	2

"Unchanged," β.

No. 37. h. 4462. Gilliss P.Z. 8001. 8.7
11h 34m 0s — 82° 31′.0.

9.1 and 9.8

1836.9	258°.7	6″.±	*h*	1 n
1880.4	257.7	4.38	Russell	1

Also registered as Russell 174.

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No. 38. h. 4460. Lac. 4832. MAG. 7.5
11h 34m 25s — 57° 11′.1.

7.8 and 9.0, both white

1834.9	178°.4	10″. ±	*h*	3 n
1876.9	176.6	8.6	Sydney	2
1878.8	181.4	9.8	C.G.A.	3

No. 39. Howe 16. C. Z. 11 h. 2341. 7.5
11h 34m 33s — 36° 52′.6.

8.2 and 8.3

1879.3	102°.8	3″.60	Cinc.	1 n
1885.3	102.5	3.32	,,	1

Also noted as double at Cordoba.

No. 40. Innes 307. C. Z. 11 h. 2354. 8.5
11h 34m 44s — 51° 7′.9.

9.2 and 9.3

1898.4	210°. ±	0″.8 ±	Innes	1 n

No. 41. β 1078. Lal. 22,102. 6.2
11h 34m 47s — 13° 54′.8.

Comes = 12.1

1889.3	49°.8	8″.22	β	3 n

No. 42. Innes 34. Lac. 4843. 5.1
11h 34m 51s — 64° 50′.6.

Comes = 11.3

1895.3	340°. ±	12″. ±	Innes	1 n

C. P. D. mag. = 6.4.
Another *comes* = 10.8 mag. 210°, 15″.

No. 43. Innes 232. Lac. 4835. 7.2
11h 34m 59s — 32° 53′.7.

7.4 and 9.4

1897.6	170°. ±	2″.5 ±	Innes	1 n

No. 44. Cape 11. Lac. 4848. MAG. 7.5
11h 35m 54s — 62° 0′.8.

8.0 and 8.5

1888.3	219°.8	2″.78	Pollock	4–3 n
1897.1	214.6	2.93	See	2

Also independently noted as double at Cordoba.

No. 45. Innes 308. C. Z. 11 h. 2470. 8.5
11h 36m 26s — 49° 38′.9.

9.2 and 9.4

1898.4	140°. ±	1″. ±	Innes	1 n

The line bisecting both stars points very nearly to Lac. 4854, mag. 8.0, which is 6s.2 pr., 33″ N.

No. 46. h. 4465. Bradley 1597. 5.0 Red
11h 36m 44s — 31° 56′.6.

Comes = 10.2

1834.3	315°. ±	7″. ±	*h*	1 n
1897.4	346.1	26.74	See	1

Combined mag. in the C.P.D. = 7.0.
The chief star has a small p.m.
There are two 8.7 mag. stars in the field, one about 4′ S.f., the other (Piazzi, 11 h. 143) is about 60″ N.f.

No. 47. Russell 177. C.P.D.—46°, 5493. 8.5
11h 40m 39s — 46° 40′.2.

9.0 yellow and 9.7

1880.3	157°.6	3″.69	Russell	1 n
1882.4	154.0	3.51	Hargrave	1

Discovered a second time at the same observatory, and registered as Hargrave 70.

No. 48. Russell 180. C. Z. 11 h. 2817. 9.0
11h 41m 48s — 52° 36′.4.

9.5 and 10.0

1873.3	180°.7	2″.65	Russell	1 n

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No. 49. λ 135. Lac. 4890. MAG. 6.8
11h 42m 16s — 29° 43′.4.

Both = 7.6

1897.4	185°. ±	0″.2 ±	See	1 n

No. 50. h. 4475. C. Z. 11 h. 2947. 8.7
11h 43m 48s — 61° 0′.7.

9.2 yellow, and 9.7 blue

1835.2	305°.4*	2″. ±	*h*	1 n
1880.4	310. ±	3.5 ±	Russell	1
1882.5	326.7	5.14	Hargrave	1

Also registered as Russell 181.
The change shewn is very probably due to p.m. in one of the stars.

No. 51. Gilliss 169. Lac. 4919. 7.8
11h 46m 55s — 64° 2′.4.

8.2 and 9.1

1883.3	230°.6	3″.53	Hargrave	1 n
1888.7	229.9	3.21	Sydney	3

Also registered as Hargrave 71.

No. 52. Harvard. Lac. 4920. 5.1
11h 46m 58s — 64° 39′.0.

5.3 and 7.8

1898.1	170°. ±	1″.5 ±	Innes	1 n

No. 53. λ 137. C.P.D.—43°, 5582. 8.4
11h 47m 0s — 43° 24′.1.

8.8 and 9.7

1897.2	347°.6	1″.22	See	1 n

No. 54. λ 138. C. Z. 11 h. 3192. 8.5
11h 47m 43s — 48° 6′.5.

8.6 and 11.6

1897.1	173°.4	2″.20	See	2 n

No. 55. h. 4478. β Hydrae. MAG. 4.5
11h 47m 51s — 33° 21′.1.

5.1 and 5.5

1834.5	338°.3	1″.87	*h*	2 n
1836.7	340.4	2.21	,,	2
1838.1	342.2	1.86	,,	1
1847.4	340.2	2.42	Jacob	2
1851.0	341.7	2.07	,,	3
1856.3	341.6	1.75	Secchi	1
1858.1	342.5	1.80	Jacob	3
1877.1	344.6	1.98	Cinc.	1
1878.0	337.9	1.95	Schiaparelli	3–2
1880.2	345.1	1.88	Cinc.	2
1889.4	349.6	1.53	β	3
1897.4	350.1	1.84	See	1

A fine pair in very slow motion.

No. 56. λ 139. C. Z. 11 h. 3295. 8.5
11h 49m 10s — 37° 2′.6.

Comes = 12.0

1897.4	38°.2	0″.88	See	1 n

No. 57. Howe 17. Lac. 4932. 6.9
11h 49m 25s — 37° 11′.7.

7.0 and 9.5

1876.3	270°. ±	1″.2 ±	Howe	1 n
1897.4	277.5	1.74	See	2

Common p.m. of 0″.284 towards 280°.6.
Registered as a new pair, Innes 214, in error.

No. 58. h. 4480. C. Z. 11 h. 3323. 9.0
11h 49m 36s — 54° 7′.0.

Comes = 12.0

1835.3	185°.6	3″. ±	*h*	1 n

The companion was not found when looked for by Mr Russell on one night in 1872. Seen here 1899.2, mags. 9.0 and 9.7; also seen at Cordoba.

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No. 59. Innes 79. C. Z. 11 h. 3331. MAG. 7.8
11h 49m 46s — 41° 50′.2.

Both = 8.6

1896.5	.....	o.″8 ±	Innes	1 n

C. Z. 11 h. 3342, mag. 8.3, is 12 secs. f. 3′ N.

No. 60. Washburn 114. Lac. 4936. 7.0
11h 49m 57s — 55° 32′.0.

7.5 and 8.0

1882	230.° ±	2.″ ±	Washburn	1 n
1887.4	206.6	1.82	Pollock	3–2
1895.4	202.6	1.77	Sellors	3
1897.1	198.5	2.14	See	2

The change shown seems considerable.

No. 61. Innes 80. C. Z. 11 h. 3367. 7.5
11h 50m 20s — 41° 20′.8.

Both = 8.3

1896.5	N.pr.	2.″ ±	Innes	1 n

No. 62. λ 140. Lac. 4943. 6.6
11h 51m 42s — 46° 31′.0.

6.8 and 8.8

1897.1	198.°5	o.″96	See	2 n

No 63. h. 4481. Lal. 22,513. 7.2
11h 52m 12s — 21° 58′.8.

7.8 blue, and 8.1 white

1836.3	198.°3	3.″ ±	*h*	1 n
1876.0	196.1	3.51	Cinc.	2
1885.2	196.7	3.21	,,	2
1893.3	197.8	3.32	Glasenapp	2
1897.3	198.0	3.28	Scott	2

Fixed.
Other measures.

No. 64. h. 4484. Lac. 4957. MAG. 6.9
11h 53m 16s — 40° 23′.5.

Comes = 11.0

1838.1	300.°6	1.″5 ±	*h*	1 n
1891.4	304.4	2.5 ±	Sellors	1
1897.1	309.6	3.41	See	1

Also registered as λ 141.
C. P. D. mag. = 7.9.

No. 65. Sellors 24. C. Z. 11 h. 3569. 8.7
11h 53m 24s — 47° 17′.7.

9.4 and 9.5

1896.3	177.°4	1.″87	Sellors	3 n

Lac. 4958, mag. 6.9, is S.pr.

No. 66. h. 4486. ε Chameleontis. 5.1
11h 54m 39s — 77° 39′.9.

5 6 and 6.3

1836.1	178.°3	1.″62	*h*	2 n
1872.4	179.0	1.47	Russell	1
1874.3	180.2	1.88	,,	1
1890.4	186.5	2.06	Sellors	1

A fine pair in very slow motion.
Common p.m. = o″.055 towards 255°.3.
On 1872.2 Mr Russell estimated the mags. of the two stars as 6.0 and 10.0 respectively.

No. 67. β 1079. Lal. 22,586. 6.2 Reddish
11h 55m 35s — 21° 16′.8.

Comes = 13.3

1889.3	147.°9	11.″7	β	3 n

Combined C. P. D. mag. = 7.0.

No. 68. β 457. Ö.A. 11,836. 8.2
11h 56m 16s — 20° 58′.4.

8.4 and 10.4

1877.4	84.°3	o.″89	Hall	2 n
1884.3	85.7	1.05	Cinc.	1
1886.3	81.3	1.18	L. McC.	1

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No. 69. Innes 215. Lac. 4979. MAG. 6.9
11h 56m 41s — 34° 5′.6.

7.1 and 9.1

1897.3	250.° ±	0.″85 ±	Innes	2 n
1897.4	237.4	0.86	See	1

Also registered as λ 142.

No. 70. h. 4490. Lac. 4991. 5.9
11h 57m 20s — 85° 4′.5.

6.0 yellow, and 9.0 blue

1837.2	143.° 2	25.″ ±	*h*	2 n
1871.4	144.1	25.7	Russell	1
1879.4	145.5	25.1	Hargrave	1

The *comes* is Cape 1840, 1534.

The p.m. of the chief star is about 0″.06 towards 260°.

No. 71. Σ 1593. W.B. 11 h. 959. 8.0
11h 58m 25s — 1° 53′.4.

8.7 and 8.8

1829.3	18.° 2	1.″43	Σ	3 n
1856.4	26.6	1.08	Secchi	1
1866.6	18.°3*	1.″33	Dembowski	3–2
1880.3	18.7	1.34	Cinc.	1
1880.4	23.6	1.49	Pritchett	4
1885.3	15.8	1.86	L. McC.	1
1893.3	20.1*	1.14	Glasenapp	4–1

Probably fixed.

There is a 13th mag. *comes* 53″ N.

Other measures.

No. 72. λ 143. Lac. 4993. MAG. 6.9
11h 58m 33s — 38° 27′.0.

7.5 and 7.9

1897.2	225.° 4	0.″72	See	1 n

No. 73. Washburn 115. Bris. 3895. 8.3
11h 58m 39s — 57° 11′.1.

8.7 and 9.7

1882	240.° ±	1.″5 ±	Washburn	1 n

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No. 1. h. 4495. Taylor 5548. MAG. 6.8
12h 0m 57s — 32° 23′.9.

Comes = 9.9

1836.2	313.8	6.″21	*h*	1 n
1852.2	315.7	6.84	Jacob	2
1877.1	315.7	6.69	Cinc.	1
1889.2	314.2	6.60	Haverford	2
1893.4	317.1	6.31	Glasenapp	1
1897.4	314.8	6.92	See	1

This star may be equal to Lac. 5015, Lac. 5022, or Bris. 3918.

Prof. See measures a 13th mag. star 26″ N.f.

No. 2. h. 4498. Lac. 5020. 5.9
12h 1m 12s — 65° 9′.1.

6.1 orange, and 8.1 blue

1835.3	59.9	15.″±	*h*	1 n
1871.3	60.1	8.88	Russell	1
1878.4	55.7	9.05	C. G. A.	3

C. P. D. mag. = 7.1.

No. 3. Harvard. η Crucis. 4.3
12h 1m 40s — 64° 3′.3.

Two *comites* within 30″. See *Harvard Circular*, No. 18.

A 10th mag. star at 30″ ± has been measured as *h* 4501. As seen with the 7-inch Cape Refractor, there is a suspicion of duplicity about the chief star.

No. 4. λ—. δ Centauri. 2.8
12h 3m 10s — 50° 9′.9.

Comes = 13.8

1897	120.° ±	6.″±	See	n

"Needs Confirmation."

The p.m. is 0″.057 towards 248°.3.

Not in Prof. See's later lists.

No. 5. β 412. Lal. 22,722. 7.8
12h 3m 13s — 18° 1′.2.

8.2 and 8.9

1877.8	163.°	2.″16	Dembowski	2 n
1878.3	165.7	2.52	Cinc.	2
1886.3	160.2	1.77	L. McC.	1

No. 6. Hargrave 74. C.G.A. 16,592. MAG. 7.5
12h 4m 8s — 63° 15′.8.

7.7 red, and 9.0

1883.5	165.° 4	1.″54	Hargrave	1 n
1894.4	165.5	2.00	Sellors	1

The middle and brightest of three stars nearly in a line.

Noted as double in the C. P. D.

No. 7. Σ 1604. Lal. 22,798. 7.0
12h 4m 18s — 11° 17′.7.

7.3 and 8.6

1832.0	93.° 3	12.″0	Σ	3 n
1869.8	91.6	11.4	Dunér	2
1892.4	91.5	10.7	β	3

Common p.m. of 0″.327 towards 121°.3 by which this pair is passing Lal. 22,803, mag. 9.0.

See:—

1892. Burnham, S. W., *Astronomy and Astrophysics*, pp. 870–872.

No. 8. Innes 216. Bris. 3942. 7.5
12h 4m 34s — 51° 13′.6.

7.7 and 9.2

1897.3	40.° ±	1.″±	Innes	1 n

Near Russell 192 and δ Centauri.

No. 9. Jacob [8]. Piazzi 12 h. 247. 6.4
12h 4m 52s — 34° 8′.8.

6.4 and 8.8

1848.0	21.° 5	3.″17	Jacob	1 n
1877.1	18.3	2.72	Cinc.	1
1885.2	20.8	3.25	,,	2
1887.4	20.8	3.07	Pollock	2
1891.3	20.3	2.47	Sellors	1

Noted as double at Melbourne, and also registered as Howe 18.

At Arequipa two *comes* within 30″ are noted. See *Harvard Circular*, No. 18.

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No. 10. Russell 191. C. Z. 12 h. 248. MAG. 9.0
12h 5m 20s — — 60° 25′.0.

Comes = 10.0

1873.3	212.3	4.33	Russell	1 n
1880.4	209.6	3.87	,,	1
1889.3	212.6	3.24	Pollock	2

In the *Proc. of the Roy. Soc. of N.S.W.* the angle for 1880.4 is given as 210°.6.

The companion was also noted at Cordoba.

No. 11. λ 145. Lac. 5045. 6.4
12h 5m 22s — 37° 18′.8.

6.6 and 8.6

1897.4	49.1	0.7 ±	See	1 n

No. 12. λ 146. Bris. 3946. 7.4
12h 5m 26s — 36° 16′.7.

Comes = 12.2

1897.4	58.1	0.66	See	1 n

No. 13. Russell 192. Bris. 3950. 8.0
12h 6m 1s — 51° 39′.7.

8.3 and 10.3

1895.4	98.9	2.92	Sellors	3 n

Noted as double at Cordoba in 1875, and also registered as Innes 14.

A somewhat similar pair 12m f.

No. 14. Lalande 94. Lal. 22,863. 7.3
12h 6m 15s — 16° 14′.0.

Comes = 9.0

1877.7	280.7	6.88	Cinc.	3–2 n

Also registered as South 634.

No. 15. h. 4505. Piazzi 12 h. 5. 7.9
12h 6m 32s — 30° 2′.7.

Comes = 9.9

1834.9	270.8	12. ±	*h*	2 n
1882.3	270.7	12. ±	Cinc.	1

No. 16. h. 4506. C. Z. 12 h. 329. MAG. 8.5
12h 6m 32s — — 23° 24′.4.

Comes = 10.7

1836.3	15.8	4. ±	*h*	1 n
1882.3	355.2	3.5	Cinc.	1

The change shown is probably due to p.m. of the chief star.

No. 17. h. 4507. C. P. D.—44°, 5879–80. 8.1
12h 7m 39s — 44° 20′.2.

8.5 and 9.3

1836.0	228.1	20. ±	*h*	3 n
1888.3	223.0	16.5	Tebbutt	2

The C. P. D. mags. are 8.8 and 9.0.

Other measures.

In the first *Sydney Catalogue* Mr Hargrave gives what purports to be a measure of this star—1879.4, 180°.4 or 179°.2, 12″.9—but in a later catalogue the measure is credited to another star here omitted as too wide. This error led Mr Russell to consider *h* 4507 an "instance of change, real or supposed."

No. 18. Howe 19. Lac. 5066. 6.5
12h 8m 25s — 33° 14′.2.

6.6 and 9.1

1876.3	175. ±	1.2	Howe	1 n
1897.3	175. ±	1.1 ±	Innes	1
1897.4	167.0	1.08	See	1

In 1891 two *comites* within 30″ were noted at Arequipa. See *Harvard Circular*, No. 18.

Also registered as Innes 217.

No. 19. Rumker 14. D Centauri. 5.4
12h 8m 49s — 45° 10′.1.

5.6 and 7.2, both orange-yellow

1837.2	248.7	4. ±	*h*	1 n
1875.8	245.2	3.17	Sydney	2
1891.3	243.4	2.90	Sellors	1
1897.1	241.7	3.11	See	4

A pretty pair showing some change.

C. P. D. mag. = 7.5.

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No. 20. λ 147. C. Z. 12 h. 490. MAG. 7.5
12h 8m 54s — 36° 10′.3.

8.2 and 8.3

1897.4	20.°5	0.″19	See	1 n

Prof. See also measures a 13th mag. star 31″ N.pr.

No. 21. Innes 81. C. Z. 12 h. 548. 9.0
12h 9m 46s — 29° 12′.7.

9.4 and 10.4

1896.4	N.	1.″±	Innes	1 n

No. 22. Sellors 10. C. Z. 12 h. 551. 7.5
12h 9m 48s — 35° 39′.8.

7.8 and 8.9

1891.4	244.°1	1.″5±	Sellors	1 n
1895.5	244.9	2.01	,,	3
1897.4	245.6	1.99	See	2

No. 23. Lalande 96. Lal. 22,955+6. 7.4
12h 10m 0s — 6° 42′.0.

8.0 and 8.3

1829.7	287.°6	7.″79	Σ	4 n
1878.2	282.3	7.65	Cinc.	1
1890.4	281.5	6.94	Glasenapp	2

Common p.m. of 0″.317 towards 260°.9.
Also registered as Σ 1619.

No. 24. β 920. Lal. 22,971. 6.8.
12h 10m 36s — 22° 47′.8.

7.1 and 8.3

1879.4	232.°4	0.″77	β	1 n
1880.4	232.4	0.92	Pritchett	2
1892.2	252.4	0.79	β	3
1892.3	250.5	0.81	Haverford	5–3
1896.5	244.0	0.84	Aitken	1
1897.3	253.7	0.94	,,	3
1898.4	247.9	1.09	See	1

The measures are very discordant.

No. 25. Russell 193. Lac. 5088. MAG. 6.5
12h 12m 34s — 35° 32′.3.

7.2 and 7.4

1881.5	168.°6	0.″83	Russell	1 n
1891.4	166.6	0.79	Sellors	1
1895.5	166.6	1.02	,,	3
1897.4	168.0	1.07	See	3

A 10th mag. star about 4′ S.pr. and an 8.6 mag. star a little further off N.f.

No. 26. β 921. Lal. 23,027. 7.0
12h 12m 44s — 23° 27′.5.

Comes = 11.0

1879.4	218.°9	2.″99	β	2 n
1881.3	218.1	3.18	,,	3
1892.2	217.3	3.20	,,	3
1892.3	218.5	2.95	Haverford	4–3

No. 27. Harvard. F Centauri. 5.0
12h 13m 40s — 54° 35′.2.

In the *Harvard Circular*, No. 18, this star is noted as having a companion within 30″.

1898. Nil. Cape 7-inch refractor.

C. P. D. mag. = 7.1.

No. 28. β 605. Bradley 1649. 6.5
12h 15m 0s — 21° 37′.2.

6.7 and 8.8

1870.3	138.°0	1.″±	Harvard	1 n
1878.2	136.3	1.01	Cinc.	2
1878.2	144.2	1.26	β	2
1882.4	141.7	0.5±	Schiaparelli	2
1889.0	137.0	0.8±	Haverford	1
1891.3	143.8	1.03	β	2

No certain change.

Common p.m. of 0″.108 towards 259°.3, which is much the same as that of the next star in the same field.

Equal to Harvard 131.

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No. 29. β 1245. ζ Corvi. MAG. 5.5
12h 15m 22s — 21° 39′.6.

Comes = 13.6

1891.3	42°.3	4″.81	β	3 n

The p.m. of the chief star is 0″.130 towards 254°.4, in which the *comes* shares.

This was thought to be a close pair at Harvard. See their No. 132.

No. 30. λ 149. C. Z. 12 h. 911. 9.5
12h 15m 57s — 44° 49′.8.

10.2 and 10.3

1897.4	305°.7	0″.59	See	1 n

No. 31. Harvard. ξ_2 Muscae. 5.3
12h 16m 34s — 66° 58′.0.

A *comes* within 30″ has been noted at Arequipa. See *Harvard Circular*, No. 18.

Cape. 1898. Nil. 7-inch refractor.

No. 32. Washburn 12. B.D.—1°, 2656. 9.5
12h 16m 45s — 2° 3′.9.

9.9 and 10.7

1881.3	93°.3	1″.13	Washburn	3 n
1888.8	94.2	1.13	,,	2

No. 33. Howe 21. Yarnall, 5250. 7.6
12h 17m 23s — 33° 0′.3.

8.0 and 9.0

1876.3	270°.±	2″.±	Howe	1 n

No. 34. Russell 198. C. Z. 12 h. 1033. 8.1 Yellow
12h 17m 59s — 51° 37′.7.

8.6 and 9.3

1880.4	50°.9	2″.63	Russell	1 n
1895.4	51.7	2.95	Sellors	3

Noted as "dpl. II" at Cordoba in 1874.

No. 35. h. 4518. Lac. 5138. MAG. 6.6
12h 19m 27s — 40° 49′.6.

6.7 yellow and 9.0 blue

1834.4	211°.1	10″.±	*h*	2 n
1889.3	207.5	10.2	Pollock	2
1897.1	208.7	9.9	See	2

Both stars have been observed on the meridian at Cordoba.

No. 36. Innes 35. C. Z. 12 h. 1148. 8.5
12h 19m 48s — 76° 19′.8.

9.1 and 9.4

1895.3	S.pr.	2″.±	Innes	1 n

No. 37. λ 151. x_2 Centauri. 5.8
12h 20m 6s — 34° 37′.9.

6.5 and 6.7

1897.5	41°.4	0″.22	See	2 n

No. 38. λ 152. Ö.A. 12,149. 8.5
12h 20m 9s — 30° 34′.6.

Comes = 12.0

1897.4	87°.1	2″.35	See	1 n

C. Z. 12 h. 1173, mag. 9.4, is closely N.pr.

No. 39. β 606. Lal. 23,250. 7.0
12h 20m 50s — 14° 23′.6.

7.2 and 8.7

1878.3	100°.5	1″.43	β	1 n
1891.3	99.1	1.25	,,	3

No. 40. β 922. Lal. 23,254. 8.0
12h 21m 0s — 3° 55′.7.

8.5 and 9.2

1891.3	165°.3	0″.74	β	3 n

Found in 1880, angle 160° ±.

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No. 41. *α* **Crucis.** MAG. 1.0
12h 21m 2s — 62° 32′.6.

1.6 and 2.0

1826.5	114°.4	5″.29	Dunlop	1 n
1835.3	120.6	5.65	*h*	17
1846.7	119.9	5.73	Jacob	3–4
1858.0	117.7	4.77	,,	2
1861.2	118.5	4.98	Powell	8–7
1873.3	119.1	5.38	Russell	6
1879.4	117.4	4.75	Hargrave	1
1880.2	120.7	4.93	Tebbutt	2
1892.5	118.3	4.75	,,	2
1895.3	117.8	4.90	,,	2–1
1897.1	115.9	4.96	See	1

Discovered in 1685 by La Feuillée.

Several faint stars are in the field, and have been measured by *h*.

Lac. 5147, mag. 6.8, is 90″ S.pr., and has been measured at different epochs, but shows no signs of change; it would therefore seem to share in the small p.m. of α Crucis, viz. :—0″.045 towards 242°.4.

Altogether a very fine object, but relatively fixed.

The group is called *h* 4521 in error by Mr Russell.

No. 42. λ 154. G Centauri. 5.1
12h 21m 8s — 50° 53′.8.

Comes = 13.0

1897.1	285°.5	23″.5	See	2 n

No. 43. Washburn 13. W.B. 12 h. 300. 8.8
12h 21m 21s — 1° 20′.0.

9.4 and 9.7

1881.3	153°.2	1″.40	Washburn	3 n
1888.3	154.5	1.28	Haverford	2
1888.4	152.0	1.50	Washburn	4–3

No. 44. Cordoba [26]. C. Z. 12 h. 1281. 8.1
12h 21m 57s — 33° 34′.6.

Comes = 10.2

1897.4	20°.1	3″.52	See	1 n

No. 45. Cape 12. Lac. 5161. MAG. 7.0
12h 22m 41s — 61° 12′.4.

7.5 and 8.0 both yellow

1880.4	270°.5	2″.43	Russell	1 n
1887.4	268°.7	1.22	Pollock	2
1891.4	264.0	1.74	Sellors	2

In motion?

Also registered as Russell 201. First seen at Cordoba, but the first notification of duplicity was made by the Cape Observatory in 1877.

Lac. 5163, mag. 7.0, is S.f.

No. 46. Russell 200. C. Z. 12 h. 1330. 9.2
12h 22m 49s — 60° 20′.3.

9.6 and 10.6

1880.4	134°.9	2″.99	Russell	1 n

No. 47. Harvard. Lac. [5169]. 6.2
12h 23m 7s — 55° 50′.8.

The Harvard observers at Arequipa have noted a *comes* within 30″. See *Harvard Circular*, No. 18.

No. 48. Innes 36. Lac. 5165. 7.7
12h 23m 19s — 61° 19′.0.

Comes = 11.0

1895.2	330°.±	7″.±	Innes	1 n

No. 49. Innes 218. Yarnall, 5202. 7.3
12h 23m 34s — 37° 24′.8.

7.5 and 9.5

1897.4	240°.±	2″.±	Innes	2 n

Yarnall, 5203, mag. 8.9, is 3 secs. f. and 3′ S.

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No. 50. H. IV. 105. δ Corvi. MAG. 3.1 Yellow
12h 24m 41s — 15° 57′.5.

Companion = 8.4 purple

1784.5	215°.8	23″.50	H	2–1 n
1848.0	213.5	24.29	Jacob	1
1866.7	214.0	24.34	Dembowski	3
1880.4	214.0	24.43	Cinc.	1

Common p.m. of 0″.212 towards 254°.7.

It will be remarked that other stars in this constellation have somewhat similar proper motions.

Also called South and *h* 145.

No. 51. β 28. Piazzi 12 h. 104. 6.5
12h 24m 56s — 12° 50′.3.

6.6 and 9.7

1875.3	353°.7	1″.95	Dembowski	4–5 n
1877.3	356.8	2.10	Cinc.	2
1880.4	356.3	2.01	Pritchett	2
1885.3	1.1	2.16	L. McC.	1
1889.2	2.4	2. ±	Haverford	2
1891.3	8.6	1.81	β	3

Common p.m. of 0″.297 towards 260°.3.

No. 52. Innes 309. Lac. 5177. 7.7
12h 25m 54s — 77° 38′.5.

Comes = 10.5

1898.4	330°. ±	4″. ±	Innes	1 n

No. 53. Innes 82. Bris. 4084. 7.9.
12h 25m 57s — 40° 57′.1.

8.3 and 9.3

1896.5	N.pr.	1″. ±	Innes	2 n

Lac. 5173, mag. 6.6, is 82 secs. pr. 14′ S.

No. 54. Innes 219. C. Z. 12 h. 1525. 8.5
12h 26m 17s — 55° 34′.1.

9.0 and 9.5

1897.4	50°. ±	1″.8 ±	Innes	1 n

Bris. 4090, mag. 7.0, red, is 20 secs. f. 1′ S.

No. 55. Leavenworth. Radcliffe 1890, 3261. MAG. 7.0
12h 28m 56s — 17° 38′.5.

7.2 and 9.4

1886.3	31°.8	1″.39	L. McC.	2 n
1888.2	32.6	1.40	Haverford	2–1

No. 56. λ 156. C. Z. 12 h. 1789. 8.5
12h 30m 46s — 35° 16′.4.

9.0 and 9.5

1897.4	123°.4	0″.51	See	2 n

The f. star of two of the 8.5 mag.

No. 57. λ 157. Lac. 5216. 6.9
12h 31m 16s — 49° 47′.0.

Comes = 12.3

1897.1	121°.3	7″.66	See	2 n

No. 58. Washburn 116. Lac. 5223. 7.3
12h 32m 31s — 55° 22′.8.

7.5 and 9.3

1889.3	193°.1	2″.00	Pollock	4–3 n
1894.4	194.0	1.21	Sellors	1
1897.1	193.4	1.86	Lowell	2

Found during an expedition to Caroline Island.

No. 59. Innes 296. Lac. 5221. 6.7
12h 32m 49s — 74° 49′.2.

6.9 and 8.8

1898.2	270°. ±	1″.9 ±	Innes,	1 n

No. 60. λ 158. Bris. 4130. 8.0
12h 33m 17s — 38° 50′.5.

8.2 and 10.2

1897.1	191°.6	0″.99	Cogshall	1 n

Found by Mr Cogshall.

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No. 61. h. 4539. γ Centauri. MAG. 2.4
12h 36m 0s — 48° 24′.6.

Both = 3.2

1852.60	22°.9	0″.3 ±	Maclear	3 n
1876.64	0.3	1.37	Melbourne	1
1879.44	4.1	1.76	,,	2

A celebrated binary system.

From all the observations to 1895.3 (excluding, however, the above, which it is believed are now published for the first time), Prof. See finds the following orbit:—

P = 88 years	T = 1848
$a = 1''.023$	$e = 0.8$
$i = 62°.15$	$\Omega = 4°.6$
$\lambda = 194.3$	

Motion:—Retrograde,

and furnishes an ephemeris, from which the following has been extracted:—

1898.4	355°.2	1″.72
1900.4	354.4	1.70

Common p.m. of 0″.217 towards 264°.7.

Prof. See also measures a star 29″.8 distant, mag. 13.6 = λ 159.

No. 62. β 607. Schj. 4572. 9.2
12h 36m 2s — 0° 54′.3.

Comes = 10.5

1867.4	320°.0	1″.40	Harvard	1 n
1878.2	313.8	1.04	Cinc.	1
1878.7	315.9	1.15	β	6
1880.3	314.5	1.08	Cinc.	2
1889.3	316.3	1.20	β	3

Also registered as Harvard 134.

γ Virginis is 35 secs. f.

No. 63. Lalande. Lal. 23,676+5. 5.3
12h 36m 4s — 12° 28′.0.

6.0 and 6.1

1828.7	298°.9	5″.44	Σ	3 n
1856.5	302.4	5 78	Secchi	4
1879.2	304.4	5.73	Cinc.	2
1887.4	304.0*	5.63	Hall	3
1890.4	304.7	4.97	Glasenapp	2
1893.3	304.9	5.60	Maw	3

Common p.m. of 0″.177 towards 353°.5.

Also registered as H. N. 38 and Σ 1669.

A 9.8 mag. star 1″.7 pr.

No. 64. γ Virginis. MAG. 2.8
12h 36m 36s — 0° 54′.0.

Both = 3.6 yellow

A celebrated binary system, with a large literature.

Here it is sufficient to refer the reader for all particulars to Prof. See's orbit and discussion in vol. i. of his *Evolution of the Stellar Systems*.

He gives the following orbit:—

P = 194 years	T = 1836.5
$a = 3''.989$	$e = 0.8974$
$i = 31°.0$	$\Omega = 50°.4$
$\lambda = 270°.0$	

Motion:—Retrograde.

The maximum distance some 6″.5 will be attained about 1934.

β has measured a faint star, 14.5 mag., distant 53″.1. The p.m. of γ Virginis will soon disclose, if this is physically connected with the system, a conclusion denied *a priori* on the law of gravitation by Prof. See.

See also:—

1896. Doberck, W. "Orbit," *Astr. Nachr.*, No. 3364.

No. 65. h. 4544. C. Z. 12 h. 2195. 9.0
12h 38m 39s — 78° 54′.8.

Comes = 13.0

1837.2	300°.7	2″.2 ±	*h*	1 n

No. 66. Cordoba [27]. Bris. 4174. 8.3
12h 39m 21s — 61° 40′.2.

8.5 reddish and 10.0

1897.6	4″. ±	Innes	1 n

Noted as double in the C. G. A.

No. 67. h. 4547. ι Crucis. 4.7
12h 39m 45s — 60° 25′.9.

4.8 yellow and 7.8 blue

1834.2	51°.5	21″.5 ±	*h*	2 n
1882.5	37.6	23.3	Hargrave	1
1896.6	36.8	20.5	Innes	1

The change in angle seems considerable, unless we take *h*'s angle as 90° − 51°.5 = 38°.5.

C. P. D. mag. = 7.6.

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No. 68. Russell 207. β Muscæ. MAG. 3.3
12h 40m 9s — 67° 33′.6.

3.9 and 4.2

1880.3	317°.3	0″.54	Russell	1 n
1886.5	322.9	0.79	,,	2–1
1886.6	325.8	0.5 ±	Pollock	1
1887.6	326.5	0.89	,,	7–3
1888.3	329.3	1.26	Tebbutt	2
1891.4	333.1	0.86	Sellors	5–2
1892.4	331.8	0.65	,,	4–2
1892.5	335.8	1.33	Tebbutt	7–2
1893.5	335.0	0.88	Sellors	2
1895.3	337.3	1.41	Tebbutt	6–2
1895.4	336.3	1.16	Sellors	3

The p.m. of this fine pair is 0″.058 towards 256°.0.

No. 69. λ 160. Cor. D.M.—38°, 7978. 9.3
12h 40m 59s — 38° 54′.0.

9.5 and 11.0

1897.4	175°.6	1″.55	See	1 n

The brightest of a small group.
Identified as Cor. D.M.—38°.7979 by Prof. See.

No. 70. Ormond Stone. C. P. D.—21°, 5441. 10.0
12h 41m 11s — 21° 53′.5.

10.2 and 12.2

1879.4	272°.4	1″.5 ±	Cinc.	1 n

The combined mag. is from the C. P. D.

No. 71. Russell 208. C. P. D.—55°, 5223. 9.3
12h 41m 19s — 55° 13′.8.

9.8 and 10.3

1880.5	5°.9	3″.64	Russell	2 n

No. 72. Harvard. Lac. 5278. 6.3
12h 41m 22s — 32° 46′.1.

Noted as double at Arequipa.
See *Harvard Circular*, No. 18.
The closest companion seen with the 7-in. Cape refractor is 2′ distant.

No. 73. Russell 209. C. P. D.—55°, 5235. MAG. 8.0
12h 42m 51s — 55° 32′.1.

8.5 and 9.0 both light yellow

1880.4	193°.2	1″.58	Russell	1 n

C. P. D. mag. = 9.4.

No. 74. Hargrave 77. Lac. 5280. 7.6
12h 42m 57s — 65° 2′.8.

7.9 and 9.3

1883.4	8°.0	7″.71	Hargrave	1 n

Noted as double at Cordoba in 1876.
Two faint pairs, Hargrave 78 and 79, are about 20′ N.

No. 75. Harvard. ι Octantis. 6.3
12h 44m 26s — 84° 34′.8.

In *Harvard Circular*, No. 18, this star is noted as having a companion within 30″. Nothing seen with the 7-in. Cape refractor.

No. 76. λ 164. C. Z. 12 h. 2686. 8.5
12h 46m 19s — 32° 48′.0.

Comes = 14.4

1897.4	189°.7	2″.46	See	2 n

Prof. See also measures a 14.8 mag. star 43″ S.f.
C. Z. 12 h. 2685, mag. 8.6, is 7′ S.

No. 77. Harvard. Lac. 5303. 5.8
12h 47m 24s — 59° 47′.1.

Noted as double within 30″ at Arequipa.
In the κ Crucis cluster.
No trace of duplicity as seen with the 7-in. Merz refractor at the Cape. Many stars about.

No. 78. Innes 297. C. P. D.—51°, 5601. 8.3
12h 48m 12s — 51° 43′.9.

8.7 and 9.7

1898 3	260°. ±	2″. ±	Innes	1 n

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No. 79. Ormond Stone. Ö.A. 12,501. MAG. 7.5
12h 48m 30s — 28° 45′.9.

7.6 and 10.1

1867.4	31°.6	3″.01	Harvard	1 n
1876.2	31.3	3.76	Cinc.	1
1877.3	31.7	2.99	,,	2
1881.3	31.5	2.99	*β*	3

Also registered as Harvard 135.

No. 80. Dunlop 126. *μ* Crucis. 4.0.
12h 48m 43s — 56° 38′.1.

4.3 and 5.4

1835.8	18°.1	42″. ±	*h*	2 n
1846.3	17.2	35.7	Jacob	3–2
1879.5	17.4	34.3	Hargrave	1

Erroneously called *h* 4555 in the *Sydney Catalogue*.
A 10th mag. star at 45″ was noted by Innes in 1895.
Two *comites* within 30″ are said to have been seen at Arequipa in 1891. See *Harvard Circular*, No. 18.

No. 81. h. 4556. Yarnall$_3$ 5478+9. 7.1
12h 48m 53s — 27° 25′.0.

7.5 and 8.5

1851.8	82°.4	5″.72	Jacob	4 n
1854.0	83.4	5.78	,,	2
1877.2	83.0	5.97	Cinc.	2
1890.4	83.4	6.02	Glasenapp	2
1897.4	81.5	6.52	See	1

No. 82. Harvard. Lac. 5321. 5.6
12h 50m 4s — 56° 17′.6.

A *comes* within 30″ has been noted at Arequipa. See *Harvard Circular*, No. 18.
1898. Nil. 7-in. at Cape.

No. 83. Innes 83. Bris. 4251. 7.0
12h 50m 59s — 47° 8′.7.

7.6 and 8.0

1896.5	pr.	0″.8 ±	Innes	2 n
1897.2	261°.3	0.44	See	1

No. 84. ℍ. II. 42. W.B. 12 h. 831+2. MAG. 7.2
12h 51m 5s — 4° 19′.4.

7.4 and 9.1

1792.7	143°.4	.....	ℍ	2 n
1832.5	149.8	5.85	Σ	6
1840.3	146.5	6.25	OΣ	2
1858.3	148.3	5.69	Morton	3
1866.6	147.5	5.94	Dembowski	3
1880.3	149.5	6.05	*β*	1
1890.4	147.0	5.83	Glasenapp	2

Probably fixed.
Also called Σ 1690.

No. 85. O.Σ. 256. Lal. 24,098. 6.7
12h 51m 19s — 0° 24′.6.

7.3 and 7.7 variable?

1842.4	231°.5*	0″.62	OΣ	1 n
1861.3	240.8	0.67	,,	1
1867.4	242.1	0.50	Dembowski	3
1875.4	244.1	0.71	Schiaparelli	4
1877.4	242.2	0.72	Cinc.	1
1887.4	251.5	0.56	Hall	3
1892.4	267.5	0.39	Lewis	2
1894.4	253.8*	0.52	Washburn	2
1895.4	253.9*	0.58	,,	3

In slow motion.
Other measures.

No. 86. Ormond Stone. Lal. 24,129. 8.0
12h 52m 35s — 12° 35′.8.

8.5 and 9.0

1879.4	66°.2	1″.47	Cinc.	1 n
1880.3	65.1	2.03	,,	3
1885.3	66.6	1.93	,,	1
1888.2	67.1	1.91	Haverford	2
1893.4	65.8	1.98	,,	2

Probably fixed.

No. 87. Cordoba [28]. C. Z. 12 h. 3034. 8.0
12h 52m 47s — 70° 5′.6.

8.2 and 9.8

1880.4	286°.0	5″.08	C. G. A.	3 n
1889.3	269.5	4.12	Pollock	4

The first measure, which is derived from meridian observations, cannot be taken as indicating change.

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No. 88. β 926. Lal. 24,147. MAG. 9.0
12h 53m 16s — 5° 30′.4.

9.1 and 12.0

1880.3	270°.4	2″.06	β	4–3 n
1892.2	274.8	2.24	,,	3
1892.3	269.9	2.23	Haverford	3

No. 89. Cape 13. Lac. 5352. 7.1
12h 54m 32s — 48° 3′.9.

7.3 and 9.7

1876.4	62°.9	6″.81	C. G. A.	3 n
1889.4	67.3	5.03	Pollock	2

See the note to No. 87. *h* 4562, a faint pair, is near this position.

No. 90. A. G. Clark 5. 46 Virginis. 6.1
12h 55m 27s — 2° 49′.9.

6.1 and 9.8

1876.4	158°.9	1″.32	Hall	3 n
1877.6	149.5	1.25	Dembowski	5
1878.3	151.5	1.48	β	2
1878.6	147.2	1.23	Cinc.	5–4
1879.1	151.5	1.44	β	4
1880.4	150.5	1.27	Cinc.	3–2
1885.4	152.7	1.39	Hall	3

The p.m. is about 0″.08.
A 12.2 mag. star has been observed at 34″ distance.

No. 91. h. 4563. Piazzi 12 h. 239. 7.3
12h 55m 34s — 33° 5′.0.

7.6 and 8.9

1837.4	236°.8	6″.55	*h*	2 n
1851.3	237.7	6.11	Jacob	3
1881.5	239.2	5.83	Russell	1
1897.4	235.7	6.72	See	2

Also registered as Russell 210.

No. 92. λ 168. Cor. D.M.—38°, 8203. MAG. 7.5
12h 58m 2s — 38° 25′.7.

Both = 8.3

1897.4	183°.1	0″.25	See	1 n

No. 93. β 928. Lal. 24,274. 8.2
12h 58m 12s — 5° 53′.7.

8.6 and 9.7

1880.3	313°.2	1″.83	β	3 n
1888.7	312.5	1.98	Haverford	2
1892.3	312.8	2.01	β	3
1893.4	313.8	2.01	Haverford	2

Noted as double at the Radcliffe Observatory in 1892.
β 927, 8.8 and 10.2 ; 4½″ apart is 37° pr. 6′ S.

No. 94. β 341. Lal. 24,275. 5.6
12h 58m 24s — 20° 2′.8.

6.1 and 6.6 yellowish

1876.3	136°.4	0″.78	Dembowski	2 n
1876.4	133.8	0.85	Cinc.	2
1877.8	139.0	0.98	,,	5–2
1878.4	136.0	0.92	Dembowski	1
1881.4	133.0*	0.6 ±	Schiaparelli	3
1881.5	133.4	0.71	β	3
1884.3	137.1	0.96	Cinc.	1
1894.5	130.5	0.3 ±	Sellors	2
1896.5	127.9*	0.78	Lick	2

The measures of this fine pair are very discordant, the angle is probably decreasing slowly.

No. 95. β 929. 48 Virginis. 6.6
12h 58m 45s — 3° 7′.5.

7.3 and 7.5

1879.4	229°.4	0″.48	β	3 n
1879.9	231.3	0.6 ±	Cinc.	2
1881.5	226.3	0.48	β	3
1885.9	222.3	0.38	Engelmann	6
1888.3	220.1	0.64	Haverford	2
1891.3	221.2	0.50	β	3
1897.3	220.8	0.67	Aitken	3

Small common p.m. of about 0″.09.

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No. 96. Cordoba [29]. C. Z. 12 h. 3410 MAG. 8.0
$12^h\ 59^m\ 18^s$ — 46° 1′.6.

8.5 and 9.0

1883.6	97°.9	4″.13	Hargrave	1 n
1891.4	96.6	4.32	Sellors	1

Independently discovered as Hargrave 81.

No. 97. β 798. Lal. 24,307. MAG. 8.2
$12^h\ 59^m\ 45^s$ — 17° 8′.3.

8.8 and 9.2

1881.4	174°.3	0″.54	β	5 n
1892.4	172.6	0.44	,,	2

The R.A. and D., which differ from β, are those of the star named with which β identifies the pair.

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No. 1. h. 4566. Lac. 5369. MAG. 6.6
13h 0m 18s — 77° 54′.6

Comes = 14.0

1835.4	221°.9	15″.±	*h*	1 n

No. 2. h. 4567. *f* Centauri. 4.9
13h 0m 29s — 47° 55′.6.

Comes = 10.8

1836.0	84°.2	12″.±	*h*	3 n
1858.1	75.6	10.6	Jacob	2
1871.4	50.±	18.±	Russell	1
1899.2	90.±	20.±	Innes	1

Russell:—"Small star only seen in glimpses."

No. 3. Dunlop 128. ξ_2 Centauri. 4.4 Yellow
13h 1m 4s — 49° 22′.2.

C. Z. 12 h. 3521 = 9.5 blue

1836.5	100°.3	26″.0	*h*	2 n
1858.1	99.7	24.8	Jacob	2
1874	97.6	23.9	C. Z. C.	1

The p.m. of the chief star is 0″.056 towards 263°.4; hence, from the above measures, the p.m. of the companion must be twice as great in the same direction.

No. 4. Russell 213. Lac. 5392. 6.7
13h 1m 14s — 59° 19′.5.

Both = 7.5 orange yellow

1874.3	27°.1	0″.33	Russell	1 n
1880.4	22.5	0.66	,,	2
1888.3	26.1	0.7 ±	Tebbutt	1
1891.4	25.3	0.72	Sellors	1

A fine pair, but evidently fixed.

No. 5. Dunlop 129. θ Muscæ. 5.6
13h 1m 40s — 64° 46′.3.

5.8 and 8.1 both white

1836.4	187°.5	6″.38	*h*	1 n
1872.4	182.7	5.35	Russell	1
1879.5	185.3	5.03	Hargrave	1
1890.4	184.7	5.08	Sellors	3

Erroneously indexed as *h* 4568 by Mr Russell.

No. 6. Washburn 118. C. Z. 13 h. 32. MAG. 8.5
13h 1m 58s — 52° 10′.3.

Both = 9.3

1894.5	205°.9	1″.36	Sellors	1 n

No. 7. h. 4569. Lac. 5401. 7.8
13h 1m 58s — 56° 9′.0.

8.0 and 10.0

1835.8	241°.9	5″.±	*h*	2 n
1873.4	239.6	4.75	Russell	1
1878.7	241.7	5.38	C. G. A.	5
1890.4	242.2	5.00	Sellors	1

Fixed.

No. 8. Washburn 174. Lal. 24,366. 7.8
13h 2m 30s — 17° 27′.9.

Comes = 11.8

1888.4	182°.6	3″.27	Washburn	1 n

No. 9. H. III. 50. θ Virginis. 4.4
13h 4m 46s — 5° 0′.4.

Comes = 8.9

1783.0	339°.3	.....	H	1 n
1802.3	341.2	.....	,,	1
1830.3	344.0	7.07	Σ	3
1854.4	342.7	7.21	Morton	2
1880.3	344.6	7.17	β	2
1890.4	343.3	7.12	Glasenapp	2

Virtually fixed with a common p.m. of 0″.074 towards 240°.0.

Also called Σ 1724.

Dembowski has measured a 10th mag. star 71″ N.pr., first measured by H in 1782, who made the distance 64″.

No. 10. Harvard. Lac. 5409. 6.4.
13h 4m 57s — 69° 25′.6.

At Arequipa a *comes* has been noted within 30″. See *Harvard Circular*, No. 18.

A very distant *comes* only seen with the 7-in. refractor.

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No. 11. Cordoba [72]. C. Z. 13 h. 220. MAG. 8.0
13h 5m 22s — 46° 45′.4.

8.5 and 9.0

1898.4	260.° ±	3.″ ±	Innes	1 n

No. 12. β 609. W.B. 13 h. 27. 7.6
13h 5m 30s — 4° 24′.4.

Comes = 11.2

1878.3	356.°1	0.″89	β	1 n
1879.4	354.9	0.9 ±	Cinc.	1
1889.3	352.1	0.89	β	2

No. 13. Innes 310. Gilliss P. Z. 9131. 8.7
13h 5m 48s — 76° 55′.6.

9.2 and 9.7

1898.4	38.° ±	1.″6 ±	Innes	2 n

No. 14. Harvard. Lac. 5418. 4.7
13h 6m 3s — 59° 23′.3.

Both = 5.5

1897.1	96.°3	0.″34	See	2 n

Common p.m. of 0″.082 towards 248°.6.
Found independently by Prof. See = λ 170.

No. 15. Howe 22. Lac. 5440. 8.0
13h 7m 29s — 28° 34′.2.

8.2 and 10.0

1877.4	292.°1	2.″75	Cinc.	2 n
1885.3	296.8	2.80	,,	1
1897.5	289.4	2.89	See	1

Separately observed on the meridian at Cordoba.
Prof. See also measures a 13th mag. star 38″ pr.

No. 16. β 221. Lal. 24,532. MAG. 7.9
13h 7m 57s — 14° 56′.8.

8.2 and 9.7

1874.3	49.°4	1.″5 ±	β	1 n
1875.3	48.6	1.68	Dembowski	3
1879.4	47.7	1.49	Cinc.	2
1886.3	43.5	1.62	L. McC.	1
1896.5	45.6	1.34	Aitken	3

About 43′ N. of 53 Virginis, mag. 5.1.

No. 17. Ḥ. II. 45. 54 Virginis. 6.2
13h 8m 6s — 18° 17′.6.

6.7 and 7.4

1792.7	34.°2	6.″ ±	Ḥ	2 n
1867.3	35.5	5.17	Dembowski	3
1876.4	33.7	5.43	Cinc.	2
1890.4	33.4	5.39	Glasenapp	2
1896.4	34.4	5.20	Scott	3

Common p.m. of 0″.084 towards 266°.6.
See also No. 20 = β 342 S.f., which has very nearly the same angle and distance.

No. 18. Melbourne [3]. Lac. 5434. 7.0
13h 8m 15s — 63° 3′.1.

7.1 and 9.6

1883.5	34.°9	1.″43	Hargrave	1 n
1894.5	35.8	1.03	Sellors	1

Also registered as Washburn 119 and Hargrave 83, but first seen at Melbourne in 1867. See their volume of *Observations* published in 1869.

No. 19. λ 171. C. Z. 13 h. 475. 7.1
13h 9m 19s — 34° 6′.1.

Both = 7.9

1897.4	301.°7	0.″41	See	1 n

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No. 20. β 342. Ö.A. 12,741. MAG. 8.2
13h 9m 53s — 18° 23′.4.

8.7 and 9.2

1876.3	36°.3	3″.90	Dembowski	2 n
1877.1	35.0	3.90	Cinc.	1
1880.4	33.8	3.96	,,	4
1882.3	35.2	4.29	,,	1
1888.3	34.2	3.80	Haverford	2
1893.4	33.0	4.84	,,	2

See also No. 17.

The similarity of both angle and distance of these two pairs has led to some confusion, the one pair having been measured for the other on several occasions.

No. 21. h. 4576. Lac. 5453. 7.5
13h 9m 56s — 56° 32′.0.

7.6 yellow and 10.4 blue

1837.3	128°.6	6″. ±	*h*	1 n
1872.4	130.1	5.91	Russell	2
1880.4	129.3	5.17	,,	1
1890.4	127.1	5.79	Sellors	1

Mr Russell in his measure of 1880 distinctly states that the star measured is not *h* 4576, and registers it as Russell 216. There is, however, only one pair here at present.

No. 22. Innes 233. Lac. 5462. 7.2
13h 11m 2s — 40° 45′.3.

7.3 and 9.5

1897.4	113°.5	3″.08	See	2 n

Noted independently as λ 173; Prof. See calling the companion 13.8 mag.

C. Z. 13 h. 581, mag. 9.5, is about 44″ N.f.

No. 23. λ 174. Lac. 5467. 7.4
13h 11m 21s — 30° 3′.8.

Both = 8.2

1897.4	1°.1	0″.16 ±	See	1 n

No. 24. β 222. Lal. 24,636. MAG. 7.8
13h 12m 0s — 21° 0′.6.

8.2 and 9.2

1867.4	12°.1	1″.46 ±	Harvard	1 n
1877.1	11.2	1.76	Cinc.	1
1894.4	14.7	1.50	Sellors	2
1896.5	14.8	1.51	Aitken	3

Also registered as Harvard 136.

No. 25. h. 4579. Bris. 4411. 8.0
13h 14m 49s — 63° 31′.4.

8.5 and 9.0 both white

1835.3	98°.0	2″.80	*h*	2 n
1875.5	96.5	4.36	Sydney	2
1880.5	99.2	4.12	,,	2

Both stars have been observed on the meridian at Cordoba.

No. 26. Harvard. J Centauri. 4.6
13h 16m 10s — 60° 27′.8.

At Arequipa two *comites* within 30″ have been observed. See *Harvard Circular*, No. 18.

No *comes* seen here with the 7-in. refractor.

Lac. 5490, mag. 6.5, is closely N.pr., and with J Centauri has been measured as Dunlop 133.

No. 27. Sellors 18. Lac. 5505. 6.6
13h 16m 55s — 47° 25′.2.

7.0 and 7.9

1895.4	224°.0	0″.77	Sellors	3 n

Another *comes*, 8.5 mag., is 38″ N.f.

Lac. 5512, mag. 7.0, is 1m. f. 3′ N.

No. 28. β 1084. W.B. 13 h. 235. 8.2
13h 17m 1s — 4° 8′.0.

Comes = 13.3

1889.3	89°.8	2″.69	β	3 n

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No. 29. h. 4580. Lac. 5507. MAG. 6.6
13h 17m 4s — 48° 2′.4.

Both = 7.4

1836.2	10.°2	0.″7 ±	*h*	1 n
1895.5	Single	.....	Sellors	3
1897.3	,,	.....	Innes	1

Probably in motion.

h had "no doubt" of its duplicity, and the equality of magnitude should make it a fairly easy pair.

No. 30. Σ 1738. W.B. 13 h. 247. 7.5
13h 17m 55s — 14° 24′.0.

8.2 and 8.3

1879.2	282.°9	4.″09	Cinc.	1 n
1890.4	282.5	3.98	Glasenapp	2

Fixed.

No. 31. β 610. Lal. 24,812. 7.0
13h 18m 32s — 20° 24′.1.

Comes = 11.2

1878.2	18.°3	4.″02	β	1 n
1878.4	17.4	3.77	Dembowski	1
1892.2	20.3	3.69	β	3
1892.4	18.5	3.82	Haverford	3

Also registered as Harvard 137.

No. 32. Cordoba [30]. Lac. 5521. 7.0
13h 19m 6s — 51° 19′.2.

7.4 and 8.5

1875.5	4.° ±	2.″7 ±	C. G. A.	1 n

No. 33. Innes 220. Lac. 5524. 7.7
13h 19m 9s — 34° 6′.8.

7.9 and 9.4

1897.4	5.° ±	0.″7 ±	Innes	1 n
1897.5	18.4*	0.21	See	1

No. 34. β 460. W.B. 13 h. 273. MAG. 7.8
13h 19m 44s — 15° 6′.6.

8.0 and 10.3

1877.4	35.°2	2.″07	Dembowski	1 n
1888.9	33.8	2.09	β	4
1892.4	34.8	2.26	Haverford	3

Fixed.

No. 35. h. 4587. C. G. A. 18,270+1. 7.5
13h 20m 33s — 42° 31′.7.

8.0 and 8.5

1837.3	90.°0	3.″ ±	*h*	1 n
1881.5	85.4	4.96	Hargrave	1
1897.4	87.5*	5.47	See	1

Separately observed on the meridian at Cordoba.

No. 36. Ormond Stone. Ö.A. 12,867. 8.1
13h 20m 48s — 22° 43′.1.

8.7 and 9.0

1879.8	354.°5	1.″55	Cinc.	2 n
1886.3	355.1	1.85	L. McC.	1

No. 37. h. 4586. Lac. 5528. 7.4
13h 21m 20s — 67° 21′.0.

7.6 and 9.4

1837.4	149.°4	3.″67	*h*	1 n
1872.9	148.9	3.87	Russell	2
1879.4	142.9	3.76	C. G. A.	3

No. 38. Russell 217. C. Z. 13 h. 1197. 8.2
13h 21m 37s — 57° 35′.0.

Both = 9.0

1874.4	170.°0	4.″17	Russell	1 n
1880.4	170.9	3.38	,,	1

In the *Proc. of the Roy. Soc. of N.S.W.* the distance for 1874 is given = 3″.99.

Also noted as "dpl. I." at Cordoba.

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No. 39. β 1107. Ö.A. 12,884. MAG. 8.2
13h 21m 42s — 21° 50′.6.

Both = 9.0

1889.4	133°.8	1″.17	β	5 n
1897.4	132.4	1.05	Aitken	3

No. 40. Russell 218. Lac. 5550. 7.0
13h 22m 13s — 43° 15′.0.

7.3 and 8.5

1881.5	167°.1	3″.84	Russell	1 n
1889.3	170.8	2.39	Pollock	3

No. 41. λ 179. *d* Centauri. 4.0
13h 25m 15s — 38° 53′.5.

4.6 and 4.9

1897.2	104°.8	0″.19	See	3 n

A very close pair.
Common p.m. of 0″.050 towards 254°.8.

No. 42. Innes 298. Bris. 4490. 7.2
13h 25m 14s — 68° 43′.0.

7.5 and 9.0

1898.3	220°. ±	0″.8 ±	Innes	1 n

The brightest of a small group of stars.

No. 43. Russell 220. C. Z. 13 h. 1434. 9.0
13h 25m 25s — 57° 55′.4.

9.7 and 9.9

1878.3	210°. ±	1″. ±	Russell	1 n
1898.3	220. ±	0.9 ±	Innes	1

Russell:—"Middle of a remarkable string of stars."
The magnitudes of the components were not given by Mr Russell, and his co-ordinates were considerably in error.

No. 44. λ 180. Lac. 5570. 7.0
13h 25m 29s — 41° 56′.9.

7.1 and 9.6

1897.2	230°.5	3″.90	See	1 n

Noted independently at the Cape within a few days of its discovery by Prof. See.

No. 45. Hargrave 86. Lac. 5564. MAG. 7.5
13h 25m 49s — 61° 49′.7.

8.0 and 8.5

1883.5	242°.1	1″.71	Hargrave	1 n
1889.3	238.7	1.57	Pollock	2

No. 46. λ 181. C. Z. 13 h. 1589. 8.0
13h 27m 58s — 37° 44′.6.

8.6 and 8.9

1897.4	102°.0	0″.43	See	1 n

Prof. See also measures a 12.5 mag. star 28″ N.f. C. Z. 13 h. 1591, mag. 8.7, is 2′.5 S.

No. 47. λ 182. C. Z. 13 h. 1625. 8.3
13h 28m 32s — 41° 53′.4.

8.5 and 10.0

1897.2	160°.6	1″.36	See	1 n

C. Z. 13 h. 1638, mag. 7.3, is 14 secs. f. 7′ N.
Independently seen at the Cape a few days after its discovery in America.

No. 48. β 114. W.B. 13 h. 438. 7.0
13h 29m 3s — 8° 6′.3.

7.6 and 8.0, both white

1875.3	137°.1	1″.49	Dembowski	4 n
1879.3	135.6	1.47	Cinc.	3
1885.3	135.4	1.60	L. McC.	1
1893.4	140.7	1.41	Haverford	2

Many other measures.
Change doubtful.
"The S.f. star of a pair in the finder":—β

No. 49. β 932. Piazzi 13 h. 126. 5.7
13h 29m 21s — 12° 42′.1.

6.2 and 6.7

1879.4	81°.2	0″.47	β	4 n
1881.4	84.9	0.51	„	3
1884.4	83.8	0.34	Hall	3

A faint star (12.4 mag.) is also noted by β 24″ S.f.
The close pair is called Y Virginis in the U. A., and was considered variable by Schmidt, Gould, and other observers. It is, however, dismissed from Chandler's *Third Catalogue of Variable Stars*.

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No. 50. Harvard. Lac. 5589. MAG. 6.5
13h 30m 25s — 61° 10′.6.

Two *comites* within 30″ have been noted at Arequipa. See *Harvard Circular*, No. 18.

One distant *comes* seen here with the 7-inch refractor.

No. 51. h. 4596. Lac. 5588. 7.7
13h 30m 26s — 64° 25′.5.

Both = 8.5

1835.3	94°.5	1″. ±	*h*	1 n
1879.5	107.1	1.15	Russell	1
1894.5	101.7	0.96	Sellors	1

Although *h* gave a correct synonym (Bris. 4540) for this star, the declination was misprinted. The error evidently escaped Mr Russell's notice, as, after an unsuccessful search for *h*'s star, this pair was registered as Russell 222.

No. 52. Innes 221. Yarnall$_3$ 5603. 7.2
13h 31m 6s — 31° 53′.5.

7.4 and 8.9

1897.4	185°. ±	0″.6 ±	Innes	1 n
1898.3	178.2	0.37	See	1

No. 53. ℍ. N. 69. Piazzi 13 h. 135. 5.6
13h 31m 16s — 25° 59′.1.

6.0 and 7.0

1835.3	193°.1	8″. ±	*h*	2 n
1857.3	192.9	10.17	Secchi	1
1876.2	191.4	10.74	Cinc.	1
1880.3	192.3	10.15	„	4

No change.

Also called Dunlop 138 and South 651.

No. 54. λ 183. C. Z. 13 h. 1841. 8.0
13h 31m 58s — 31° 51′.0.

Both = 8.8

1897.4	262°. ±	0″.25	See	1 n

Another close pair pr.

No. 55. λ 184. Lac. 5615. MAG. 7.2
13h 32m 4s — 34° 33′.3.

7.4 and 8.9

1897.3	310°.9	0″.99	See	2 n

Closely f. Lac. 5613, mag. 7.0, and a 9.7 mag. star.

Noted independently at the Cape in 1897.

No. 56. β 611. Lal. 25,159. 8.8
13h 32m 20s — 14° 13′.2.

8.9 and 11.2

1878.4	259°.4	4″.63	β	2 n
1880.4	263.1	4.58	Cinc.	1
1884.3	263.0	2.50	„	2

The last distance looks like a misprint for 4″.50.

Discovered independently as a new pair by Prof. O. Stone.

No. 57. ℍ. I. 80. 81 Virginis. 7.0
13h 32m 21s — 7° 21′.7.

7.7 and 7.8

1782.1	48°.8	[1″.75]	ℍ	1 n
1802.3	42.8	.....	„	1
1830.3	39.0	2.69	Σ	4
1854.6	42.1	2.63	Maclear	1
1856.4	43.8	2.78	Morton	2
1868.2	42.3	2.63	Dembowski	4
1880.4	41.2	2.93	Cinc.	2
1882.4	43.3	2.66	Pritchett	2
1891.9	42.4	2.97	Glasenapp	4

Fixed.

Common p.m. of about 0″.05.

Also called Σ 1763.

No. 58. Cape 14. C. Z. 13 h. 1865. 8.5
13h 32m 25s — 41° 52′.6.

8.9 and 9.9

1897.4	290°. ±	3″. ±	Innes	1 n

Discovered at the Transit Circle by Mr W. H. Cox.

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No. 59. λ 186. Piazzi 13 h. 143. MAG. 7.0
13h 32m 46s — 29° 19′.8.

Both = 7.8

1897.5	196°.8	0″.20	See	1 n

No. 60. h. 4600. C. Z. 13 h. 1902. 7.8
13h 33m 5s — 48° 29′.3.

Comes = 9.3

1836.3	119°.1	15″.±	*h*	1 n
1880.6	143.8	16.6	Hargrave	1
1882.5	118.7	16.4	„	1

The measure of 1880 which indicated change is evidently erroneous.

No. 61. h. 4598. Lac. 5592. 7.0
13h 33m 9s — 74° 36′.5.

Comes = 12.0

1835.3	42°.4	15″.±	*h*	1 n
1871.5	45.4	12.6	Russell	1

The magnitude of the chief star has been estimated as follows :—

Lacaille	7.0
h	5.0
Gilliss	7.8
Russell	6.0 yellow
U. A.	7.0

No. 62. H. C. Wilson. C. Z. 13 h. 1924. 9.2
13h 33m 25s — 30° 14′.5.

9.8 and 10.1

1883.3	80°.±	2″.±	Cinc.	1 n

No. 63. Dunlop 141. Q Centauri. 5.5
13h 35m 20s — 54° 3′.1.

5.8 and 7.1

1835.4	164°.0	5″.40	*h*	2 n
1871.5	163.7	5.25	Russell	1
1891.4	163.8	5.36	Sellors	2
1897.1	162.9	5.07	See	3

Registered by Mr Russell both as ζ Centauri and *h* 1713.

No. 64. h. 4608. Lac. 5649. MAG. 7.3
13h 36m 36s — 33° 28′.5.

8.0 and 8.2

1834.8	170°.3	4″.±	*h*	2 n
1851.2	174.5	4.41	Jacob	2
1876.3	178.5	4.41	Cinc.	3
1879.3	180.3	4.85	Melbourne	1
1890.4	179.2	4.53	Glasenapp	2
1894.5	178.8	4.35	Sellors	1
1896.4	177.2	4.62	Scott	2

There are many other measures. Nature of change remains doubtful.

No. 65. λ 187. C. Z. 13 h. 2114. 8.3
13h 36m 37s — 36° 52′.2.

Comes = 12.8

1897.4	33°.0	3″.89	Lowell	2 n

No. 66. Howe 23. Lac. 5656. 7.0
13h 37m 55s — 39° 40′.4.

7.5 and 8.0

1876.3	190°.±	1″.5±	Howe	1 n
1897.4	187.8	2.08	See	1

Registered as Innes 222 by error.

No. 67. Σ 3081. W.B. 13 h. 645. 8.8
13h 39m 51s — 11° 19′.8.

9.4 and 9.8

1830.6	76°.3	1″.97	Σ	3 n
1878.3	67.2	2.02	β	2
1880.3	67.8	2.08	Cinc.	2
1880.9	71.5	2.09	Pritchett	2
1886.3	69.6	2.12	Cinc.	1

No. 68. Innes 223. Lac. 5660. 6.8
13h 40m 12s — 62° 5′.2.

6.9 red, and 10.4 blue

1897.4	310°.±	10″.±	Innes	1 n

Retained on account of the marked colours of the stars.

C. P. D. mag. = 8.3.

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No. 69. Harvard. M Centauri. MAG. 4.6
13h 40m 19s — 50° 55′.9.

At Arequipa a companion within 30″ has been noted. See *Harvard Circular*, No. 18.

Two distant faint stars only are revealed by the 7-inch Cape refractor.

Near a fine cluster of stars.

The mag. of M Centauri from the C. P. D. plates = 6.6.

No. 70. β 935a. 86 Virginis. 6.0
13h 40m 36s — 11° 55′.5.

Comes = 10.4

1879.4	298°.4	1″.61	β	5 n
1880.4	299.9	1.63	Cinc.	3–2
1881.4	296.1	1.33	β	2
1889.3	299.6	1.66	„	3
1897.4	293.8	1.52	Aitken	3

With the next pair this forms the old pair Σ 1780 rej.

The p.m. is about 0″.03.

β found two small diffused faint nebulæ S. pr.

No. 71. β 935b. Anon. 10.2
13h 40m 36s — 11° 55′.9.

Comes = 11.0

1879.4	274°.2	1″.72	β	3 n
1889.3	275.9	2.24	„	3
1897.4	270.6	2.09	Aitken	3

86 Virginis = β 935a is 26″.9 N.pr.

It will be noted that β thus found both components of Σ 1780 rej. to be double stars.

No. 72. Cordoba [31]. C. Z. 13 h. 2375. 8.5
13h 40m 51s — 63° 21′.7.

9.0 and 9.6

1896.5	257°.1	2″.44	Sellors	3 n

No. 73. Dunlop 143. Bris. 4629. MAG. 7.5 Red
13h 42m 16s — 61° 36′.3.

Bris. 4630 = 8.1 greenish

1836.9	35°.8	12″.7	*h*	2 n
1871.3	34.9	12.0	Russell	1
1877.5	34.9	12.1	Cape M. Obs.	3
1878.3	38.6	12.4	C. G. A.	4
1879.5	34.7	11.6	Hargrave	1

Fixed.

No. 74. Howe 24. Lac. 5682. 6.4
13h 43m 11s — 35° 12′.0.

C. Z. 13 h. 2526 = 10.0

1876.4	355°. ±	8″. ±	Howe	1 n
1897.4	353.0	11.45	See	2

No. 75. Harvard. μ Centauri. 3.3
13h 43m 36s — 41° 58′.5.

A companion within 30″ has been noted at Arequipa. See *Harvard Circular*, No. 18.

Prof. See measures a 14th mag. star 47″ S.f., and here the 7-inch refractor shows nothing nearer.

No. 76. h. 4616. C. Z. 13 h. 2601. 9.5
13h 44m 35s — 70° 40′.8.

9.7 and 11.7

1835.3	349°.9	2″. ±	*h*	1 n

No. 77. h. 4617. Lac. 5701. 7.3
13h 45m 2s — 29° 22′.7.

7.5 and 9.5

1835.0	255°.0	4″. ±	*h*	1 n
1880.3	259.7	1.27	Cinc.	1
1883.4	260.8	5.09	„	1
1897.5	260.3	5.10	See	1

The Cinc. distance of 1880.3 seems erroneous.

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No. 78. Rumker 18. N Centauri. MAG. 5.4
13h 45m 38s — 52° 18′.9.

Bris. 4655 = 7.3

1835.4	287°.1	18″. ±	*h*	1 n
1871.4	289.5	18.1	Russell	1
1897.2	288.7	18.2	See	2

Erroneously called *h* 4617 by Mr Russell. See preceding entry.

No. 79. ℍ. III. 101. *k* Centauri. 4.4
13h 46m 3s — 32° 29′.9.

4.7 and 5.9

1783.1	112°.0	[11″.58]	ℍ	1 n
1836.6	112.7	8.82	*h*	5
1851.1	111.1	8.44	Jacob	2
1857.3	109.8	7.88	Secchi	1
1876.3	111.0	8.18	Cinc.	2
1890.4	109.7	7.64	Glasenapp	2
1897.2	109.3	8.11	See	2

There are other measures.

Common p.m. of 0″.103 towards 194°.2 indicating physical connection.

Some change shown.

Also recorded as Dunlop 148.

No. 80. β 343. Lac. 5712. 6.7
13h 46m 17s — 31° 7′.4.

7.0 and 8.4

1877.4	130°.2	1″.37	Cinc.	1 n
1889.4	129.7	1.70	β	4
1894.4	122.0	0.93	Sellors	2
1897.2	123.0	1.05	See	3

No. 81. ℍ. N. 51. *h* Centauri. 4.9
13h 47m 27s — 31° 26′.0.

C. Z. 13 h. 2820 = 8.0

1837.5	185°.6	13″.8	*h*	2 n
1897.4	185.1*	14.5	Scott	1

Fixed with a small common p.m. of 0″.065 towards 203°.1.

Other measures.

No. 82. Howe 25. *y* Centauri. MAG. 5.7
13h 47m 42s — 35° 10′.2.

6.4 and 6.6

1877.4	80°.3	0″.6 ±	Cinc.	2 n
1889.4	84.0	1.28	β	3
1893.5	86.3	0.85	Sellors	2
1897.4	86.5	0.99	Aitken	3

Also registered as β 1108, with a 15th mag. star at 27″.5.

At Arequipa noted as triple within 30″. See *Harvard Circular*, No. 18.

This was also noted as a wide pair in 1783 = ℍ V. 124, 54″, the companion being C. Z. 13 h. 2838 mag. 8.5.

No. 83. h. 4626. C. Z. 13 h. 2852. 9.0
13h 48m 28s — 69° 46′.8.

Both = 9.8

1835.3	58°.1	3″. ±	*h*	2 n
1882.5	55.8	4.01	Hargrave	1

No. 84. Berlin. W.B. 13 h. 783. 8.7
13h 48m 46s — 14° 38′.1.

Both = 9.5

1890.4	115°. ±	1″.9 ±	Berlin	2 n

No. 85. Howe 26. Lac. 5751. 7.4
13h 49m 30s —31° 36′.5.

7.6 and 9.1

1877.4	117°.9	6″.41	Cinc	1 n
1897.4	116.3	6.24	See	4

Also noted in the same year as double at Cordoba.

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No. 86. Σ 1788. Bradley 1820. MAG. 6.4
13h 49m 43s — 7° 34′.0.

6.6 and 8.3

1825.4	51°.7	2″.76	South	n
1831.4	54.0	2.37	Σ	5
1852.2	64.9	2.66	OΣ	2
1864.8	67.7	2.36	Dembowski	4
1877.4	70.1	2.57	Cinc.	2
1891.1	76.1	2.60	Maw	3–2
1893.3	76.0	2.74	Haverford	2
1896.0	76.0	2.58	Comstock	5

Common p.m. of 0″.202 towards 270°.0.

A binary system, at present in slow motion.

The apparent rectilinear motion is seven times greater than the apparent orbital motion.

Other measures.

No. 87. Russell 227. Lac. 5741. 6.6
13h 49m 46s — 53° 38′.5.

6.9 and 8.1, both yellow

1880.4	348°.5	1″.03	Russell	1 n
1891.4	349.0	1.20	Sellors	1
1897.2	352.7	1.44	See	2

At the time of discovery of this fine pair (in 1878) Mr Russell estimated both components = 9.0.

An 11th mag. star is about 30″ pr. noted by Innes and See.

The chief star is probably also = Lac. 5738.

No. 88. Innes 224. Yarnall$_3$ 5852. 7.5
13h 50m 18s — 38° 10′.4.

7.7 and 9.7

1897.4	183°.0	2″.28	See	1 n

No. 89. Dunlop 151. Lac. 5750. 7.0
13h 50m 40s — 55° 32′.9.

7.2 and 8.6 blue

1835.9	309°.9	11″.5	*h*	2 n
1876.4	1.3	11.3	C. G. A.	1
1894.5	22.2	13.2	Sellors	3
1895.5	23.0	13.4	,,	3

Rectilinear motion, if in one star only, of about 0″.25 towards 250° or 70° according to which star it is, the latter angle applying to the smaller star.

Many other measures.

h, in error, registers this star as a new pair = *h* 4634, but the measures on page 32 of Mr Russell's catalogue are not applicable to this pair, although there set down for *h* 4634.

No. 90. h. 4630. C. Z. 13 h. 3019. MAG. 8.2
13h 50m 53s — 65° 9′.1.

8.8 and 9.1

1835.3	313°.9	4″.5 ±	*h*	2 n
1874.5	314.5	4.46	Russell	1
1888.3	314.1	4.18	Tebbutt	1

In the field with the next pair.

No. 91. h. 4632. Lac. 5740. 6.2
13h 51m 3s — 65° 18′.7.

Comes = 10.6

1835.3	11°.8	6″. ±	*h*	1 n
1881.5	15.5	5.89	Sydney	2

Called triple (T) in *Harvard Circular*, No. 18, but with the 7-inch Cape refractor no third star can be seen.

C. P. D. mag. = 8.0.

No. 92. λ 193. Lac. 5764. 8.0
13h 51m 13s — 27° 10′.2.

Comes = 14.7

1897.5	163°.7	6″.72	See	1 n

Lac. 5763, mag. 7.0, is closely N.pr.; and a close pair is N.f.

No. 93. Innes 234. Ö.A. 13,258. 8.3
13h 51m 28s — 27° 2′.0.

8.7 and 9.4

1897.5	314°.1	0″.58	See	1 n

Also registered as λ 194.

There is a 9.8 mag. star 3′ N.

No. 94. h. 4636. C. Z. 13 h. 3088. 8.9
13h 51m 45s — 39° 29′.3.

9.5 and 9.8

1834.8	29°.9	1″.6 ±	*h*	5 n
1893.5	36.7	2.5 ±	Sellors	1

h:—"A close double star in a very evident nebula 2′ or 2½′ in diameter." The nebula is *h* 3548.

C. Z. 13 h. 3105, mag. 9.0, is 19 secs. f. 1′ N.

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No. 95. h. 2692. Ö.A. 13,274. MAG. 9.0
13h 52m 20s — 16° 51′.0.

9.4 and 10.2

1885.0	322°.6	3″.13	Cinc.	2 n

Another star, 9.5 mag., is 27″ S.pr.
B. D.—16°, 3770, mag. 9.3, is 4 secs. pr. 2′.4 N.

No. 96. Harvard. Lac. 5761. 6.4
13h 53m 21s — 65° 46′.9.

A *comes* within 30″ has been noted at Arequipa. See *Harvard Circular*, No. 18.
With the 7-inch Cape refractor only a *comes* distant 40″ or more is seen.

No. 97. β 344. Ö.A. 13,285. 9.2
13h 53m 30s — 25° 3′.6.

9.9 and 10.1

1877.3	120°.8	3″.38	Cinc.	1 n
1879.3	126.3	.....	,,	1
1880.3	124.4	3.31	,,	2

No. 98. Innes 225. Bris. 4713. 7.2 Orange.
13h 54m 14s — 62° 28′.0.

Comes = 10.9

1897.4	290°.±	3″.±	Innes	1 n

Noted as difficult at the time of discovery.
C. P. D. mag. = 8.5.
Lac. (5762), mag. 7.5, is 80 secs. pr. 10′ N.

No. 99. Russell 231. C. Z. 13 h. 3221. 9.0
13h 54m 26s — 66° 41′.6.

Comes = 9.8

1880.5	160°.0	3″.86	Russell	1 n

No. 100. Russell 232. C. Z. 13 h. 3227. MAG. 8.5
13h 54m 31s — 66° 32′.0.

Both = 9.3

1874.5	176°.9	6″.15	Russell	1 n
1880.5	175.6	4.99	,,	1

Also noted as double at Cordoba.
This pair is also = Russell 234.
1899.2:—N. star is 0.2 mag. fainter than the S. star.

No. 101. h. 4640. Lal. 25,730. 8.5
13h 55m 55s — 9° 53′.5.

Both = 9.3

1836.4	134°.3	4″.±	*h*	1 n

h had a doubt as to duplicity.
Looked for in 1889:—No such pair seen in the neighbourhood.

No. 102. β 1197. Lac. 5791. 6.5
13h 57m 13s — 31° 12′.3.

6.7 and 8.7

1890.4	178°.9	0″.86	β	3 n
1897.4	185.2	1.18	See	1
1897.4	187.9	0.93	Aitken	3

No. 103. Cordoba [32]. Brisbane 4750. 7.8
13h 58m 59s — 49° 55′.2.

Both = 8.6 coloured

1891.5	66°.9	2″.74	Sellors	1 n
1895.5	67.7	2.51	,,	3

No. 104. Σ 1799. Lal. 25,841. 7.7
13h 59m 34s — 6° 4′.4.

8.0 and 9.2

1830.7	293°.0	4″.03	Σ	3 n
1867.3	294.2	3.99	Dembowski	3
1879.3	294.3	4.35	Cinc.	2
1890.4	295.3	4.36	Glasenapp	2

Virtually fixed.

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No. 1. β **938. Piazzi 13 h. 294.** MAG. **8.0**
$14^h\ 0^m\ 38^s$ $-26°\ 6'.0$.

8.7 and 8.8

1879.4	117°.6*	0″.89	β	2 n
1892.4	119.1*	0.62	Haverford	4–2
1892.4	117.1	0.65	β	3
1897.4	111.5	0.72	Aitken	1

Closely N.pr. π Hydrae, 3.5 mag.

No. 2. Dunlop 156. θ **Centauri.** **2.2**
$14^h\ 0^m\ 48^s$ $-35°\ 52'.7$.

There is some unexplained mystery about this star. In 1826 Dunlop saw a companion S.f. 3″, and we learn from Prof. See's list of new stars that a companion was again seen in 1891 (8.0 mag.) at Arequipa. It was looked for here in 1896 and 1897, but not seen.

Prof. See has measured a faint star 70″ S.f. (his λ 196).

The p.m. of θ Centauri is 0″.764 towards 227.0.

A somewhat similar case of disappearance is offered by the companion to ϵ Eridani ($3^h\ 28^m$) seen only at Cordoba.

No. 3. Sellors 19. Lac. 5817. **6.9**
$14^h\ 1^m\ 13^s$ $-49°\ 23'.6$.

7.4 and 8.1

1895.5	229°.6	1″.07	Sellors	3 n

No. 4. h. 4649. C. Z. 14 h. 20+1. **8.3**
$14^h\ 2^m\ 0^s$ $-59°\ 14'.9$.

Both = 9.1

1836.4	67°.6	11″.±	*h*	2 n
1875.5	64.6	8.12	Sydney	2
1879.4	67.4	9.35	C. G. A.	2–3

Colour :—*h* and Sydney :—both red
Cordoba :—B, orange-yellow
and the latter observatory finds B a quarter of a mag. brighter than A.

No. 5. λ **197. Ö.A. 13,394.** **8.5**
$14^h\ 2^m\ 13^s$ $-26°\ 52'.1$.

Both = 9.3

1897.5	36°.0	0″.26	See	1 n

No. 6. Σ **1802. Lal. 25,901.** MAG. **7.0**
$14^h\ 2^m\ 40^s$ $-12°\ 27'.0$.

7.3 and 8.5

1830.6	285°.5	4″.22	Σ	3 n
1867.0	284.7	4.68	Dembowski	3
1879.3	282.1	4.83	Cinc.	3

Common p.m. of 0″.15 towards 137°.

No. 7. Washburn 16. Lal. 25,923. **8.4**
$14^h\ 3^m\ 11^s$ $-3°\ 3'.5$.

9.1 and 9.3

1881.4	218°.3	3″.09	Washburn	3 n
1883.7	211.4*	3.30	Engelmann	6
1888.4	215.2	3.05	Washburn	3
1893.4	215.7	2.37	Haverford	1

No. 8. h. 4655. C. Z. 14 h. 166. **8.0**
$14^h\ 4^m\ 3^s$ $-36°\ 31'.2$.

8.2 and 9.7

1834.8.	268°.9	5″.±	*h*	2 n
1889.4	268.0	5.52	Pollock	2
1897.2	268.2	6.05	See	1

No. 9. Pollock [3]. Bris. 4789. **8.5**
$14^h\ 4^m\ 35^s$ $-46°\ 26'.2$.

9.0 and 9.7

1887.4	54°.3	4″.16	Pollock	2 n

The place given in the second *Sydney Catalogue* is 17′ in error.

Mr Power, at the Transit Circle, noted Bris. 4789 to be double, and a search with the 7-inch showed that it was the only double star in the neighbourhood agreeing with Mr Pollock's description.

No. 10. β **803. Lal. 25,991.** **8.0**
$14^h\ 5^m\ 48^s$ $-2°\ 12'.2$.

Comes = 11.5

1888.4	220°.0	5″.38	Washburn	3 n
1892.4	226.5	5.54	β	3
1893.4	240.1	4.78	Haverford	1

Considerable change shown.

Washburn 17 = B.D.—1°, 408, mag. 9.2, a $4\frac{1}{2}$″ pair, is 30^s pr.

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No. 11. h. 4661. Ö.A. 13,452. MAG. 8.3
14h 6m 18s — 28° 25′.1.

9.0 and 9.1

1835.±	229.0°	2.″ ±	*h*	1 n
1880.4	229.0°	.....	Cinc.	1
1883.4	232.5	4.40	,,	1

No. 12. Cordoba [33]. Lac. 5844. 6.9
14h 7m 41s — 61° 14′.3.

7.1 and 9.2

1887.5	159.6°	2.″98	Pollock	3 n
1890.5	156.9	2.28	Sellors	1

Separately observed on the meridian at Cordoba in 1875.

No. 13. Harvard. Lac. 5850. 5.2
14h 7m 59s — 56° 37′.0.

Two *comites* within 30″ have been seen. See *Harvard Circular*, No. 18.

No. 14. Harvard. Lac. 5846. 5.9
14h 8m 45s — 66° 7′.3.

A companion within 30″ has been seen. See *Harvard Circular*, No. 18.

No. 15. β 939. Lal. 26,065. 8.5
14h 8m 51s — 8° 3′.3.

9.2 and 9.4

1879.9	156.1°	0.″65	β	2 n
1888.3	147.5	0.72	Haverford	2=1

B.D.—7°, 3798, mag. 9.5, is 87″ N.pr.

No. 16. Harvard. R Centauri. 6.0 9.8
14h 9m 22s — 59° 26′.9.

A variable star, with a companion within 30″. See *Harvard Circular*, No. 18.

No. 17. λ 202. C. Z. 14 h. 620. MAG. 8.3
14h 10m 59s — 29° 30′.4.

8.8 and 9.4

1897.5	109.1°	0.″91	See	1 n

Prof. See also measures a 12.5 mag. star 31″ S.f.

No. 18. h. 1249. O.A. 13,508. 8.5 Red.
14h 11m 30s — 15° 58′.5.

Comes = 11.6

1829.0	[155.° ±]	5.″ ±	*h*	1 n
1878.4	163.5	.....	Cinc.	1

No. 19. Howe 28. Ö.A. 13,520. 8.5
14h 12m 27s — 27° 3′.5.

Both = 9.3 white

1877.2	119.8°	3.″16	Cinc.	2 n

Prof. See finds A to be a close pair.
Howe 27, a wide and faint pair, is about 20′ S.pr.

No. 20. h. 4667. Lac. 5865. 7.3
14h 13m 19s — 73° 5′.8.

7.9 and 8.3

1835.3	138.3°	2.″ ±	*h*	1 n
1879.5	138.2	1.60	Hargrave	1

Separately observed on the meridian at Cordoba.

No. 21. β 1246. Lac. 5892. 6.1
14h 13m 20s — 25° 21′.8.

Comes = 14.3

1891.4	187.1°	2.″99	β	3 n

Common p.m. of 0″.512 towards 307°.3.
β notes another star 11th mag., 36″ away.
C. P. D. combined mag. = 7.1.

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No. 22. β 1110. **Bris. 4857.** MAG. **7.1**
Orange-yellow.
14h 13m 41s — 36° 23′.8.

Comes = 10.6

1889.4	130.°7	3.″95	β	3 n
1897.4	133.4	3.52	See	1

The *comes* was well seen in 1896 with the 7-inch Cape refractor.

C. P. D. combined mag. = 8.1.

No. 23. h. 4672. **Lac. (5887).** **6.5**
14h 13m 53s — 42° 35′.9.

6.6 yellow, and 9.5 blue

1837.3	302.°0	3.″ ±	*h*	1 n
1881.6	303.5	3.58	Hargrave	1
1890.5	303.7	4.01	Sellors	2
1897.2	304.2	4.02	See	1

There may be a p.m.

No. 24. **Washburn 18.** **Piazzi 14 h. 38.** **7.8**
14h 13m 54s — 18° 3′.8.

Comes = 11.3

1881.4	357.°9	3.″58	Washburn	3 n
1888.4	356.6	3.82	„	3–1

No. 25. **Cape . . . .** **Lal. 26,177.** **8.0**
14h 14m 9s — 13° 14′.5.

8.5 and 9.0, both white

1876.4	278.°8	3.″21	Cinc.	2 n
1885.3	278.0	3.12	„	1
1893.4	276.5	3.08	Haverford	1

Other measures.

Fixed.

Also registered as β 116. This pair was discovered by G. W. H. Maclear, and not by W. Mann, as stated in error in the *Mem. R. A. S.*, vol. xxxiv. p. 45, 1866.

No. 26. λ 204. **ψ Centauri.** **4.2**
14h 14m 28s — 37° 25′.5.

Comes = 13.0

1897.1	86.°5	35.″2	See	2 n

C. P. D. mag. = 5.4.

No. 27. **Cordoba [34].** **C. Z. 14 h. 825.** MAG. **8.0**
14h 14m 31s — 41° 59′.0.

8.7 and 8.9

1889.4	211.°3	1.″83	Pollock	3 n
1896.5	211.6	1.77	Sellors	3

Separately observed on the meridian at Cordoba in 1878.

No. 28. **Dunlop 159.** **Lac. 5893.** **5.0**
14h 15m 27s — 58° 0′.1.

5.2 yellow, 6.8 greenish

1836.9	163.°3	9.″64	*h*	3 n
1858.1	163.3	9.02	Jacob	2
1871.4	159.2	9.78	Russell	2
1879.5	159.9	9.01	Hargrave	1

The companion has been estimated as low as 10th mag. C. P. D. combined mag. = 6.5.

Equal to Rumker 19.

Another *comes*, mag. 9.7, = C. P. D. – 57°, 6620.

1835.0	4.°1	35.″ ±	*h*	1 n
1871.4	1.4	45.9	Russell	2

No. 29. **Russell 244.** **Lac. 5901.** **6.5**
14h 16m 6s — 47° 51′.8.

6.6 and 9.6 blue

1881.5	125.°3	3.″95	Russell	1 n

No. 30. h. 4671. **Lac. 5864.** **7.5**
14h 17m 3s — 79° 39′.1.

8.1 and 8.4

1836.8	127.°4	5.″94	*h*	1 n
1873.4	126.8	6.76	Russell	1
1880.4	124.0	5.36	„	1

Mr Russell's later observation is recorded as a new pair, Russell 243.

Both components have been observed on the meridian at Cordoba.

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No. 31. Σ 1833. **Mayer 585.** MAG. 6.2
14h 17m 21s — 7° 18′.6.

6.9 and 7.0

1832.4	166°.7	4″.92	Σ	3 n
1866.7	167.3	5.14	Dembowski	3
1879.2	168.4	5.32	Cinc.	3
1889.4	169.5	5.71	Glasenapp	4
1891.4	167.8	5.64	Hough	1

Practically fixed.

Common p.m. of 0″.171 towards 185°.0.

The motion through space is at least ten times greater than the orbital motion.*

No. 32. Σ 1837. **Bradley 1861.** 6.5
14h 19m 18s — 11° 13′.0.

6.7 and 8.4

1829.8	326°.9	1″.41	Σ	4 n
1848.4	324.5	1.50	Mitchel	1
1853.0	318.4	1.56	Jacob	5
1868.2	312.9	1.40	Dembowski	7
1877.4	306.8	1.43	Cinc.	2
1888.4	303.2	1.45	Hall	3

Many other measures.

Some change shown.

Small common p.m. of about 0″.05.

No. 33. Ormond Stone. Yarnall$_3$ 6052. 7.3
14h 19m 25s — 27° 40′.5.

7.6 and 8.7

1877.4	270°.4	0″.5 ±	Cinc.	1 n
1880.4	275.6	0.8 ±	,,	2
1897.5	285.8	0.31	See	1

This pair seems worthy of more attention than it has received.

No. 34. β 225. **Lal. 26,319.** 7.3
14h 19m 52s — 19° 30′.8.

7.7 and 8.6

1867.4	102°.5	1″.06	Harvard	1 n
1875.7	101.9	1.40	Dembowski	3
1877.4	101.6	1.32	Cinc.	2
1890.4	101.5	1.66	Glasenapp	2
1893.5	98.7	1.24	Sellors	1

Also registered as Harvard 138.

Lal. 26,320, mag. 7.0, is 35″ S.f., and, with the above pair, composes the old pair H. N. 80.

In several catalogues a correction of 10m to the R.A. is required.

No. 35. Cordoba [35]. Lal. 26,334. MAG. 8.2
14h 20m 37s — 23° 45′.7.

8.5 and 9.7

1879.4	110°.0	2″.05	C. G. A.	3 n

No. 36. Harvard. Lac. 5934. 6.3
14h 20m 45s — 45° 40′.9.

At Arequipa two *comites* within 30″ have been seen.

See *Harvard Circular*, No. 18.

No. 37. β 940. **l Hydrae.** 5.0
14h 22m 19s — 29° 2′.5.

Comes = 11.1

1879.4	276°.8	4″.00	β	3 n
1889.4	278.7	4.27	,,	3
1897.4	278.7	5.37	See	2

The p.m. of the chief star is 0″.068 towards 242°.8.

No. 38. Hough 386. B.D.—22°, 3793. 7.8
14h 22m 43s — 22° 33′.6.

Comes = 12.0

1893.3	326°.6	3″.76	Hough	1 n

B.D.—22°, 3794, mag. 8.1, is 6s f. 2½′ N.

No. 39. Harvard. Bris. 4918. 6.3
14h 22m 55s — 67° 16′.1.

At Arequipa two *comites* within 30″ have been seen.

See *Harvard Circular*, No. 18.

C. P. D. mag. = 7.6.

* No. 31. This assumes that the proper motion is wholly due to the stars themselves, and independent of the sun's movement through space.

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No. 40. Σ 1846. φ Virginis. MAG. 4.9
14h 23m 3s — 1° 46′.8.

Comes = 9.3

1829.7	108°.8	3″.73	Σ	5 n
1848.4	109.3	4.00	Mitchel	1
1875.4	112.6	4.27	Temple Obsy.	2–1
1887.4	113.8	4.46	Hall	3
1890.4	109.9	4.50	Glasenapp	2

Common p.m. of 0″.153 towards 269°.3.
Other measures.

No. 41. Harvard. Lac. 5950. 5.5
14h 23m 41s — 49° 4′.3.

At Arequipa two *comites* within 30″ have been seen.
See *Harvard Circular*, No. 18.

No. 42. Cinc. W.B. 14 h. 388. 8.8
14h 24m 3s — 14° 34′.2.

9.2 and 10.1

1879.4	202°.0	″.....	Cinc.	1 n
1880.3	198.7	3.70	,,	5

Discovered by H. V. Egbert.

No. 43. β 462. 1st Munich 10,229. 9.1
14h 24m 48s — 3° 16′.5.

9.8 and 10.0

1877.4	324°.4	2″.01	Dembowski	2 n
1880.3	328.9	1.96	β	1
1891.3	325.1	2.16	,,	3

A 12th mag. star 15″ away.

No. 44. β 117. Lal. 26,481. 8.0
14h 25m 49s — 15° 11′.1.

8.5 and 9.2

1867.4	96°.7	2″.16	Harvard	1 n
1876.4	95.8	2.44	Dembowski	3
1878.7	92.9	2.23	Cinc.	2
1881.9	92.2	2.17	β	2
1884.4	95.3	2.36	Hall	3
1888.4	90.4	2.29	Haverford	2
1890.4	96.6	2.53	Glasenapp	2

Common p.m. of 0″.438 towards 147°.4.
Also equal to Harvard 139, and Prof. Hall remarks that this pair was discovered by J. R. Eastman. The pair is undoubtedly Burnham's by priority of publication.

No. 45. λ 206. Lac. 5975. MAG. 7.3
14h 26m 3s — 31° 44′.5.

7.4 and 10.5

1897.4	190°.8	1″.11	See	1 n

A 14.5 mag. star is 23″ N.f.

No. 46. Harvard. Lac. 5969. 6.5
14h 26m 36s — 52° 14′.2.

Noted as double within 30″ at Arequipa.
See *Harvard Circular*, No. 18.

No. 47. β 1112. Lac. 5983. 6.0
14h 27m 14s — 30° 16′.4.

Comes = 11.0

1889.4	7°.6	2″.44	β	6 n
1897.4	3.1	2.46	Aitken	3
1897.4	7.7	2.66	See	2

C. P. D. mag. = 7.6.
Registered as a new pair in *Harvard Circular*, No. 18.

No. 48. h. 4685. C. Z. 14 h. 1713. 9.0
14h 28m 18s — 45° 43′.4.

9.6 and 9.9

1834.5	76°.±	0″.6 ±	*h*	1 n
1882.2	83.4	2.21	Russell	1

No. 49. λ 207. η Centauri. 2.5
14h 29m 9s — 41° 43′.1.

Comes = 13.5

1897.1	270°.1	5″.65	See	3 n

The p.m. of the chief star is 0″.058 towards 236°.4.

No. 50. Harvard. Piazzi 14 h. 110. 6.3
14h 29m 12s — 41° 4′.6.

A companion within 30″ has been seen at Arequipa.
See *Harvard Circular*, No. 18.

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No. 51. Russell 248. C. Z. 14 h. 1772. MAG. 8.3
14h 29m 12s — 46° 14′.8.

8.7 and 9.5

1874.4	291°.4	5″.50	Russell	1 n
1897.2	290.9	5.43	See	3

Also noticed as a double star at Cordoba about the same time.

No. 52. Russell 249. C. Z. 14 h. 1758. 8.1
14h 29m 18s — 62° 4′.3.

8.3 and 10.1

1881.6	33°.6	2″.77	Russell	1 n
1882.5	35.0	4.14	Hargrave	1
1896.5	35.1	2.88	Sellors	3

First seen at Cordoba.

Also registered as Hargrave 102.

No. 53. h. 4687. C. Z. 14 h. 1793. 7.7
14h 29m 29s — 36° 6′.8.

8.4 and 8.6

1836.4	81°.1	2″.46	*h*	1 n
1837.6	83.5	2.03	„	1
1856.5	84.0	1.89	Jacob	2
1889.4	87.6	1.77	Pollock	1
1897.4	92.1	1.65	Lowell	4

The N.pr. of three stars.

No. 54. Harvard. Lac. 5995. 5.3
14h 29m 46s — 45° 48′.5.

A companion within 30″ has been noted at Arequipa.

See *Harvard Circular*, No. 18.

Mag. in C. P. D. = 7.4.

No. 55. Cordoba [36]. C. Z. 14 h. 1808. 8.4
14h 30m 6s — 59° 55′.2.

8.7 and 10.0

1882.5	134°.5	4″.43	C. G. A.	1 n

C. Z. 14 h. 1809, mag. 9.2, is 67″ S.

No. 56. h. 4690. *a* Lupi. MAG. 5.4
14h 30m 37s — 45° 41′.8.

5.5 yellow, and 7.8 blue

1834.5	26°.3	25″.±	*h*	1 n
1846.8	24.8	19.0	Jacob	2
1880.4	23.6	19.8	Russell	1

Both components have been observed on the meridian at Cordoba.

Mags. in C. P. D.: —7.5 and 8.2.

No. 57. Howe 29. Yarnall$_3$ 6124. 7.5
14h 30m 59s — 37° 5′.8.

8.0 and 8.5 bluish

1889.4	214°.6	4″.30	Pollock	2 n
1890.5	215.4	3.96	Sellors	1
1897.2	213.8	4.24	See	3

Also seen at Cordoba.

No. 58. *β* 804. W.B. 14 h. 558. 8.4
14h 32m 46s — 8° 14′.3.

8.5 and 11.3

1881.5	166°.2	1″.40	*β*	2 n
1888.7	159.5	1.39	Washburn	3–2
1891.3	160.9	1.29	*β*	3

No. 59. Richaud. *a* Centauri. 0.2
14h 32m 48s — 60° 25′.4.

0.4 yellow, and 1.9 deep yellow

Orbits of this noble double star will be found in most treatises on Astronomy.

Here, an ephemeris for the next few years taken from Prof. See's paper in the *M. N. of the R. A. S.*, vol. liv. p. 114, may be sufficient.

1899.5	209°.5	21″.92
1900.5	210.0	21.96
1901.5	210.4	21.95
1902.5	210.8	21.89

Prof. See makes the length of the apparent major axis 32″.50; the common p.m. of the centre of gravity of the system is 3″.688 towards 281°.5. Remembering that this is the thwart motion only, it will take at most four and two-fifths years' motion through space to describe a distance equal to the apparent major semi-axis of the system. Moreover, adopting the parallax 0″.75 found by Gill and Elkin, a distance equal to the major semi-axis of the Earth's orbit is described every seventy-four days.

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This pair has been the subject of many papers, among which the following will be found:—

1856. Powell, Eyre B., "Orbit," *Mem. R. A. S.*, vol. xxiv. pp. 91–95.

1876. Stone, E. J., "Proper Motions," *M. N. R. A. S.*, vol. xxxvi. pp. 258–265.

1880. Elkin, W. L., "Dissertation." 4to. Karlsruhe.

1884. Gill, D., and Elkin, W. L., "Orbit," etc., *Mem. R. A. S.*, vol. xlviii. p. 15.

1893. Roberts, A. W., "Orbit," *Astr. Nachr.*, No. 3175.

1893. See, T. J. J., "Orbit," *M. N. R. A. S.*, vol. liv. No. 2.

1893. Tebbutt, J., "Measures," *M. N. R. A. S.*, vol. liv. No. 2.

1895. Roberts, A. W., "Mass," etc., *Astr. Nachr.*, Nos. 3313 and 3324.

1896. Doberck, W., "Orbit," *Astr. Nachr.*, No. 3330.

1896. Roberts, A. W., "Orbit," *Astr. Nachr.*, No. 3360.

There are several faint stars near enough to this system to be of interest. One, mag. 10.5, at 82″ was measured by Mr Sellors in 1896. With the McClean Telescope two fainter *comites* were picked up here in 1898, one of which is much nearer than the 10.5 mag. star. See appendix of new double stars.

No. 60. β 226. Lal. 26,665. MAG. 8.0
14h 33m 13s — 21° 53′.6.

8.7 and 8.9, both white

1875.4	81°.0	0″.7 ±	Schiaparelli	2 n
1877.4	80.9	0.97	Cinc.	2–1
1879.3	80.3	1.02	,,	1
1879.4	82.7	0.95	β	1
1880.3	83.1	0.99	Cinc.	1
1884.3	85.3	1.01	,,	2
1890.4	85.1	0.9 ±	Glasenapp	3

Slow increase in angle.

The mag. in the C. P. D. = 7.3.

No. 61. λ 209. Lac. 6026. 6.7
14h 33m 46s — 45° 21′.7.

Comes = 13.8

1897.2	240°.7	12″.78	See	1 n

No. 62. β 805b. Anon. MAG. 10.0
14h 34m 15s — 26° 40′.4.

10.1 and 12.6

1881.4	239°.7	1″.99	β	3 n
1888.9	243.1	1.99	Washburn	2–1

Ö.A. 13,799, mag. 7.2, with a faint *comes* at 24″, is 2′ S.pr., and composes the pair β 805*a*.

No. 63. Dunlop 166. α Circini. 3.4 White.
14h 34m 25s — 64° 32′.4.

Cape 1880, 7974 = 8.2, brick-red

1837.0	244°.0	15″.7	*h*	4 n
1872.0	240.3	15.7	Russell	2
1885.6	239.2	15.9	Tebbutt	1
1897.2	249.9	17.8	See	1

Common p.m. of 0″.315 towards 220°.1.

The contrast of colour in this pair is very striking; it requires no imagination to notice the peculiar hue of the *comes*. There is no other such coloured pair in the southern heavens.

No. 64. β 806b. Lac. 6042. 6.9
14h 34m 36s — 25° 49′.5.

7.1 and 9.1

1890.4	96°.3	0″.67	β	3 n

Seen in 1897 with the Cape 7-inch refractor.

The chief star of the old pair β 806, since the discovery of which both stars have been proved double. See below for the second star which is 71″.5 N.f. in the direction 67°.3 from β's measures in 1881 and 1890.

A 13.5 mag. star, 17″.8 distant, has been observed in the direction 329°.6.

No. 65. β 806a. C. Z. 14 h. 2121. 8.5
14h 34m 41s — 25° 49′.0.

8.9 and 9.8

1881.4	347°.8	1″.22	β	3 n
1890.4	344.9	1.20	,,	3

This is the *comes* of the old pair β 806. See the preceding star.

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No. 66. Harvard. α Lupi. MAG. 2.5
$14^h\ 35^m\ 17^s$ — 46° 57′.5.

A companion within 30″ has been observed at Arequipa.

See *Harvard Circular*, No. 18.

No. 67. Dunlop 168. C. Z. 14 h. 2164+2. 7.5
$14^h\ 35^m\ 36^s$ — 54° 45′.2.

8.2 and 8.4, both bluish

1837.1	204.1	6.70	*h*	3 n
1872.5	202.2*	6.05	Russell	1

Indexed erroneously as *h* 4693 by Mr Russell.

N.pr. Lac. 6057, mag. 6.4, and Bris. 5026, mag. 7.5, two stars 68″ apart.

No. 68. β 345. Lac. 6051. 7.2
$14^h\ 35^m\ 50^s$ — 29° 16′.1.

7.6 and 8.3

1877.4	308.2*	0.88	Cinc.	1 n
1880.4	299.4	0.90	,,	1
1892.4	303.5	0.94	β	3
1897.4	301.9	0.98	Aitken	3
1897.5	303.7	0.92	See	2

No. 69. β 414. Lac. 6052. 6.6
$14^h\ 35^m\ 53^s$ — 30° 30′.2.

6.9 and 8.2

1889.4	345.6	1.01	β	3 n
1896.5	346.5	0.90	Lick	4
1897.4	342.5	0.86	See	1
1897.4	344.9	0.89	Aitken	3

No. 70. λ 210. Yarnall$_3$ 6153. 8.0
$14^h\ 35^m\ 58^s$ — 32° 23′.1.

Both = 8.8

1897.4	264.8	0.48	See	1 n

Prof. See also measures two distant faint *comites*. A 6.9 mag. star is N.f.

No. 71. Cordoba. C. Z. 14 h. 2171. MAG. 8.3
$14^h\ 36^m\ 44^s$ — 75° 33′.5.

9.0 and 9.2

1880.6	124.5	1.24	C. G. A.	1 n

Noted as double in the C. P. D.

No. 72. Cordoba [37]. C. Z. 14 h. 2250. 8.7
$14^h\ 37^m\ 3^s$ — 37° 6′.8

9.3 and 9.6

1897.4	269.5	2.29	Lowell	2 n

No. 73. Harvard. Lac. 6039. 5.2
$14^h\ 37^m\ 21^s$ — 62° 26′.9.

A companion within 30″ has been observed at Arequipa.

See *Harvard Circular*, No. 18.

No. 74. β 807. W.B. 14h. 644. 8.5
$14^h\ 37^m\ 41^s$ — 6° 22′.7.

8.9 and 10.0

1881.4	239.0	1.24	β	3 n
1888.5	242.4	1.13	Haverford	1
1888.5	237.2	1.19	Washburn	3

No. 75. Harvard. Lac. 6057. 6.2
$14^h\ 37^m\ 58^s$ — 55° 10′.6.

Two *comites* within 30″ have been noted at Arequipa.

See *Harvard Circular*, No. 18.

Bris. 5026, mag. 7.5, is closely S.f., and with the above star forms the old pair, Dunlop 169.

No. 76. Washburn 19. C. P. D. —24°, 5366. 9.3
$14^h\ 37^m\ 59^s$ — 24° 50′.7.

9.5 and 11.1

1881.4	194.9	1.76	Washburn	2 n
1888.4	195.3	1.64	,,	2

4 Librae, mag. 5.8, is N.pr.

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No. 77. Innes 235. Lac. 6046. MAG. 7.2
14h 39m 10s — 68° 5′.9.

7.6 and 8.6

1897.5	120.° ±	1.″ ±	Innes	2 n

Two other stars are in the field.

No. 78. h. 4696. Lac. 6072. 7.2
14h 39m 25s — 44° 26′.7.

Comes = 14.0

1834.4	212.°6	4.″ ±	*h*	1 n

No. 79. h. 4698. *b* Lupi. 5.1 Yellow
14h 40m 1s — 51° 57′.6.

Comes = 11.8

1836.5	262.°7	10.″ ±	*h*	1 n
1897.2	259.9	9.01	See	4

This fine pair has a common p.m. of o″.128 towards 188°.7.

Registered as a new pair by Prof. See in the *Astr. Nachr.*

C. P. D. mag. = 7.2.

No. 80. H. III. 97. *m* Hydrae. 5.1
14h 40m 13s — 25° 1′.1.

5.3 and 7.2

1783.0	128.°2	11.″28	H	1 n
1823.2	136.7	9.90	South	–
1834.4	136.8	7. ±	*h*	1
1856.5	130.7	8.56	Secchi	1
1876.4	129.8	9.68	Cinc.	1
1880.4	129.5	9.20	„	3
1890.4	129.1	8.73	Glasenapp	2
1896.4	130.3	8.54	Scott	2
1897.5	128.1	9.00	See	1

The companion is U.A. 383 Hydrae.

Common p.m. of o″.224 towards 243°.0.

The discordances, especially in distance, in the few measures of this easy pair, seem too large to be due to accidental errors. Can one of the components be double, and if so, is it beyond the reach of our present instruments?

No. 81. Harvard. Lac. 6074. MAG. 6.5
14h 40m 13s — 51° 47′.1.

No. 82. Harvard. Lac. 6059. 6.1
14h 40m 16s — 66° 10′.4.

To each of the above stars the Arequipa observers assign a companion within 30″.

See *Harvard Circular*, No. 18.

No. 83. Washburn 20. 5 Librae. 6.6
14h 40m 27s — 15° 2′.3.

Comes = 11.7

1881.4	249.°8	2.″69	β	3 n
1888 7	244.3	2.70	Washburn	4–2
1889.4	249.2	2.79	β	3

The p.m. of 5 Librae is small, about o″.04.

No. 84. Σ 1876. Lal. 26,890. 7.8
14h 41m 4s — 6° 57′.7.

8.3 and 8.8 white

1831.0	46.°8	1.″01	Σ	3 n
1833.3	55.4	1.31	„	4
1844.3	57.2	1.24	Mädler	1
1848.4	59.8	0.95	Mitchel	1
1856.9	60.8	1.00	Secchi	2
1857.5	61.6	1. ±	Dembowski	3
1863.4	65.8	1.20	„	3–2
1878.3	68.0	1.25	Cinc.	2
1887.4	73.0	1.13	Hall	2
1895.5	75.1	1.01	Comstock	3

Other measures.

A binary in slow motion.

An 11th mag. star at 71″ has been measured by Prof. Hough.

No. 85. λ 212. C. Z. 14 h. 2568. 7.4
14h 41m 51s — 31° 49′.7.

8.0 and 8.4

1897.4	28.°7	0.″26 ±	See	1 n

C. P. D. mag. = 8.5.

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No. 86. λ 213. Ö.A. 13,938. MAG. 8.1
14h 42m 13s — 29° 59′.8.

8.5 and 9.4

1897.5	167°.3	0″.24	See	1 n

Ö.A. 13,941, mag. 8.0, is closely S.f.

No. 87. β 346. Lal. 26,940. 7.0
14h 42m 57s — 16° 55′.3.

7.4 and 8.2

1877.4	236°.1	1″.28	Dembowski	2 n
1878.4	235.3	1.23	Cinc.	2
1881.0	239.2	1.18	Schiaparelli	2

No. 88. Innes 236. Lac. 6066. 5.6
14h 43m 13s — 72° 46′.7.

Comes = 9.0

1897.5	92°.±	1″.9 ±	Innes	1 n

At Arequipa two *comites* to this star within 30″ were noted in 1891. See *Harvard Circular*, No. 18.
C. P. D. mag. = 7.1.

No. 89. β 617. Ö.A. 13,951. 8.7
14h 43m 29s — 23° 50′.9.

8.9 and 10.5

1878.3	336°.6	2″.73	β	2 n
1880.4	337.2	2.14	Cinc.	2
1897.5	335.3	2.57	See	1

Lac. 6111, mag. 5.7, is 59″ N.f.

No. 90. β 106. μ Librae. 5.4
14h 43m 50s — 13° 43′.9.

5.8 red, and 6.6 blue

1875.6	335°.0	1″.38	Dembowski	5 n
1877.0	335.1	1.53	Schiaparelli	7
1877.4	335.8	1.67	Cinc.	2
1878.3	333.2	1.50	β	1
1879.3	335.0	2.02	Cinc.	3–2
1883.4	337.4	1.51	Engelmann	6
1888.3	339.2	1.63	Haverford	3
1889.4	340.6	1.61	β	3
1890.4	339.0	2.01	Glasenapp	2
1897.4	340.2	1.57	Aitken	3

Common p.m. of 0″.097 towards 260°.6.
A binary system in very slow motion.
Five very faint distant *comites* have been observed by β.

No. 91. h. 4706. Bris. 5073. MAG. 8.1
14h 44m 33s — 46° 59′.5.

8.5 and 9.4, both yellow

1837.0	217°.4	7″.13	*h*	2 n
1848.1	221.1	6.41	Jacob	2
1878.5	219.9	7.82	C. G. A.	3
1881.5	216.7	6.26	Hargrave	1
1897.2	218.9	6.65	See	3

Fixed.

No. 92. h. 4707. Bris. 5071. 7.7
14h 45m 46s — 66° 0′.2.

8.4 and 8.6

1835.3	219°.7	1″.5 ±	*h* (mirror)	1 n
1837.5	225.2	1.50	,, (O. G.)	4
1871.4	Not found.	Foggy	Russell	1
1897.6	140°. ±	0″.7 ±	Innes	1

A binary system showing some 280° change in sixty years, but more measures are required.
The p.m. is about 0″.29 towards 211°.5.

No. 93. h. 4712. C. Z. 14 h. 2944. 7.8
14h 48m 6s — 55° 1′.4.

8.5 and 8.6

1835.4	227°.3	6″.27	*h*	2 n
1877.4	227.8	6.70	Sydney	2

Fixed.

No. 94. β 118. Ö.A. 14,034. 8.3
14h 48m 7s — 16° 6′.2.

8.7 and 9.5

1875.9	307°.4	1″.84	Dembowski	2 n
1879.7	306.0	1.96	Cinc.	2
1886.3	308.6	1.95	L. McC.	1
1898.5	305.5	1.88	See	1

No. 95. Innes 226. Lac. 6135. 7.0
14h 48m 17s — 33° 44′.0.

Comes = 11.0

1897.4	230°. ±	2″.5 ±	Innes	1 n

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No. 96. β 942. Harvard Zone 51, No. 58. MAG. 11.3
14h 48m 31s — 0° 3′.3.

12.0 and 12.1

1879.4	189.°9	1.″24	β	2 n
1892.3	191.2	1.26	,,	3

The mags. given by β are 9.2 and 9.3.

No. 97. β 347. Lac. 6137. 6.3 Orange
14h 48m 31s — 32° 53′.6.

Comes = 10.5

1889.4	320.°6	13.″0	β	3 n
1890.4	319.8	13.4	Glasenapp	2
1897.4	318.1	12.9	Aitken	2

The C. P. D. mag. = 7.7.
Another star, 9.8 mag., is 58″.5 distant.

No. 98. Innes 84. Lac. 6138. 7.5
14h 48m 41s — 36° 1′.3.

7.7 and 9.8

1896.7	270.° ±	4.″ ±	Innes	3 n
1897.4	255.6	4.90	See	1

Prof. See gives a difference of brightness between the two components of 7.1 mags.
C. Z. 14 h. 3006, mag. 8.5, is 5′.5 S.

No. 99. Harvard. Lac. 6105. 6.5
14h 49m 7s — 74° 37′.7.

Noted as double at Arequipa, the *comes* being within 30″.
See *Harvard Circular*, No. 18.

No. 100. h. 4715. Lac. 6141. 5.7
14h 49m 44s — 47° 28′.4.

6.0 and 7.2

1836.0	277.°8	3.″04	*h*	3 n
1850.8	281.1	2.41	Jacob	3
1854.0	278.5	2.54	,,	2–1
1877.4	278.5	3.30	Melbourne	2
1893.5	275.9	2.08	Sellors	1
1896.5	277.3	3.25	Innes	1
1897.1	277.7	2.71	See	2

Fixed.

No. 101. Washburn 21. B. D.—14°, 4070. MAG. 8.6
14h 50m 3s — 14° 19′.7.

9.3 and 9.4

1881.4	23.°0	3.″92	Washburn	3 n
1888.4	21.5	3.79	,,	3
1888.4	22.0*	3.86	Haverford	1

Other measures.

No. 102. Innes 227. Lac. 6152. 7.3
14h 50m 21s — 34° 13′.6.

7.8 and 8.3

1897.4	110.° ±	0.″9 ±	Innes	1 n
1897.4	100.0	0 76	See	1

A 9.6 mag. star, 48″ N.f., = C. P. D. – 34°, 6262.
Equal to λ 215.

No. 103. h. 4716. C. P. D.—24°, 5406. 9.1
14h 50m 32s — 24° 16′.2.

9.5 and 10.3

1834.4	2.°0	1.″5 ±	*h*	1 n
1856.5	11.7	1.5 ±	Secchi	1
1879.8	357.7	3.10	Cinc.	2
1882.4	357.6	3.26	,,	2
1897.5	357.8	3.03	See	1

Prof. See identifies this pair with C. Z. 14 h. 2984.
Identification adopted agrees with *h*'s position.
C. Z. 14 h. 3126 is 11 secs. f.

No. 104. h. 4718. Bris. 5123. 7.0
14h 51m 21s — 34° 58′.8.

7.2 orange, and 8.8 blue

1834.3	72.°5	1.″2 ±	*h*	1 n
1856.3	62.1	1.86	Jacob	2–1
1858.1	61.6	2.10	,,	1
1897.4	62.3	2.26	See	1

Noted as double at Cordoba in 1878.
Combined mag. in C. P. D. = 8.2.

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No. 105. H. N. 28. Piazzi 14 h. 212–4. MAG. 5.9
14h 51m 37s — 20° 57′.8.

6.1 yellow, and 7.6 orange

1806.0	251°.4	9″.4	Piazzi	M.O.
1823.3	270.1	10.82	South	1 n
1836.7	277.4	12.08	*h*	1
1856.3	284.0	13.34	Jacob	2
1877.4	290.2	14.98	Cinc.	1
1878.5	290.3	15.02	Dembowski	1
1879.3	289.5	15.42	Cinc.	2
1881.4	291.3	15.38	β	4
1881.5	290.8	15.46	Pritchett	1
1884.4	291.2	15.90	Hall	3
1885.3	292.0	15.61	Cinc.	1
1886.3	293.0	15.71	,,	1
1896.4	293.6	16.76	Comstock	1
1896.4	292.4	15.60	Scott	2
1898.3	293.6	17.12	See	1

Common p.m. of 2″.014 towards 151°.3.

An important system of the 61 Cygni class.

Also called South and *h* 190.

A determination of the parallax with the Cape heliometer has been undertaken by Mr de Sitter.

No. 106. Gilliss 213. Lac. 6136. 7.2
14h 52m 20s — 67° 35′.0

7.4 and 8.9

1872.6	335°.5	5″.65	Russell	1 n
1887.5	332.6	5.07	Pollock	3
1896.5	333.7	5.06	Sellors	3′

Also registered as Russell 255.

In the *Mem. R. A. S.*, vol. xlvii., the Dec. is given as −69° 35′ in error.

No. 107. β 239. 59 Hydrae. 5.8
14h 52m 44s — 27° 15′.4.

6.5 and 6.6

1874.5	303°.7*	0″.8 ±	β	5 n
1875.4	308.4	0.9 ±	Schiaparelli	1
1878.4	309.5*	0.93	β	1
1879.4	310.5	0.98	Cinc.	3–2
1880.4	307.4	0.90	,,	4
1881.4	312.0	1.07	β	4
1888.4	308.3*	0.95	Haverford	1
1889.4	311.4	0.86	β	3
1897.5	315.8	0.92	See	2

The p.m. is less than 0″.1.

As is generally the case with close pairs so disadvantageously placed for northern observers, the measures are somewhat discordant.

A binary system.

No. 108. β 808. B. D.—8°, 3872. MAG. 9.4
14h 52m 51s — 8° 16′.9.

Both = 10.2

1881.4	201°.5	0″.63	β	2 n

W.B. 14 h. 950, mag. 9.0, is 94″ N.pr.

No. 109. Innes 237. C. Z. 14 h. 3269. 8.8
14h 52m 55s — 41° 33′.3.

9.3 and 9.8

1897.7	205°. ±	0″.8 ±	Innes	2 n

In a line with C. Z. 14 h. 3264, mag. 9.3, and C. Z. 14 h. 3265, mag. 9.6.

All N.f. κ Centauri, mag. 3.4.

No. 110. h. 4722. Lac. 6183. 7.2
14h 53m 27s — 30° 18′.6.

7.4 yellow, and 9.6 orange

1836.0	346°.7	9″. ±	*h*	2 n
1885.3	340.6	8.13	Cinc.	1
1890.4	341.0	8.77	Glasenapp	2
1897.5	338.7	8.63	Lowell	4

Also registered as Howe 30.

Prof. See also measures two distant faint stars.

No. 111. β 1085. Piazzi 14 h. 229. 6.5
14h 53m 40s — 4° 35′.2.

Comes = 13.7

1889.3	19°.5	9″.34	β	3 n

The p.m. of the chief star is 0″.430 towards 256°.6.

No. 112. h. 4723. Lac. 6182. 7.5
14h 54m 51s — 51° 31′.2.

7.6 yellow, and 11.0 blue

1836.0	171°.5	5″. ±	*h*	2 n
1872.5	166.5	5.60	Russell	1
1897.2	167.3	5.34	See	1

"The chief of a pretty bright group":—*h*.

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No. 113. Cape 15. Lac. 6158. MAG. 7.1
14h 56m 24s — 71° 46′.7.

7.3 and 9.3

1880.5	42°.1	1″.68	Russell	1 n

The only measure found, but it was noted by Mr Russell in 1872.

First intimation of duplicity, viz., "Very close double star," was given in the volume of *Cape Meridian Observations* for 1874, published in 1877.

No. 114. Washburn 22. Porter 2557. 8.9
14h 56m 27s — 19° 52′.9.

9.3 and 10.1

1881.4	360°.1	2″.22	Washburn	3 n
1888.4	359.0	2.18	,,	3

The combined C. P. D. mag. is 8.1.

No. 115. λ 218. Lac. 6199. 6.7
14h 57m 19s — 35° 33′.0.

Both = 7.5

1897.6	11°.3	0″.19 ±	See	1 n

No. 116. h. 4728. π Lupi. 3.8
14h 58m 18s — 46° 39′.6.

4.5 and 4.6

1835.4	112°.8	0″.75 ±	*h* (o. g.)	1 n
1836.3	109.8	0.7 ±	,, (mirror)	1
1837.0	108.6	0.75 ±	,, (o. g.)	1
1848.1	106.3	1.2 ±	Jacob	1
1853.6	103.0*	1.24	,,	4–3
1872.4	100.1	0.57	Russell	1
1877.4	98.7	1.42	Melbourne	1–2
1880.4	99.3	0.90	Russell	1
1880.5	90°.9	0″.5 ±	Cruls	1
1886.6	91.3	0.71	Sydney	3–2
1887.6	87.2	1.24	Pollock	4–3
1888.7	86.3	1.50	Tebbutt	1
1891.6	85.8	0.86	Sellors	1
1892.5	87.4	1.42	Tebbutt	5–4
1893.5	86.8	1.01	Sellors	2
1894.5	88.2	0.96	,,	2
1895.4	87.1	1.61	Tebbutt	4–3
1895.5	87.2	1.25	Sellors	3
1897.1	87.7	1.30	See	2

Common p.m. of 0″.059 towards 234°.9.

Evidently a binary system, but there has been no change since 1887. The distance has probably increased since its discovery.

A somewhat similar arrest of motion occurs in the northern pair 44 Boötis. See Prof. Burnham's paper in *M. N. R. A. S.*, vol. lvii. pp. 393–398, 1897.

No. 117. Innes 85. C. Z. 14 h. 3624. MAG. 8.5
14h 58m 34s — 35° 32′.1.

8.9 and 10.0

1896.6	181°. ±	1″.5 ±	Innes	1 n

Lac. 6199, mag. 6.7, 75 secs. pr., is a close pair = λ 218.

C. Z. 14 h. 3631, mag. 9.1, is 4 secs. f. and S.

No. 118. Harvard. Lac. 6209. 5.3
14h 58m 49s — 40° 40′.6.

At Arequipa two *comites* within 30″ have been noted. See *Harvard Circular*, No. 18.

C. P. D. mag. of Lac. 6209 is 6.7.

No. 119. Hough 391. Lal. 27,415. 7.7
14h 58m 50s — 6° 29′.8.

7.8 and 10.8

1891.4	141°.6	1″.85	Hough	1 n

A star, 12.5 mag., is 44″ distant.

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No. 1. β 119. Lal. 27,454. MAG. 7.3.
15h 0m 14s — 6° 37′.5.
7.9 and 8.3

1875.9	313°.1	1″.51	Dembowski	4 n
1878.6	311.1	1.41	Cinc.	2
1887.4	309.1	1.56	Tarrant	3
1888.4	306.4	1.61	Haverford	2
1890.4	304.9	1.78	Glasenapp	2
1892.4	307.1	1.47	Haverford	3

Slow change.

No. 2. Harvard. T Triang. Austr. 6.9–7.4.
15h 0m 24s — 68° 20′.1.

This variable star has a period of 0.98 days.

According to the Arequipa observers, there are two companions within 30″.

See *Harvard Circular*, No. 18.

No. 3. λ 219. λ Lupi. 4.3
15h 2m 6s — 44° 53′.6.
4.8 and 5.4

1897.1	178°.9	0″.30	See	2 n
1897.5	340°. ±	0.6 ±	Innes	1

In the latter observation the stars were all but separated.

The p.m. is very small, about 0″.03 towards 180°.

No. 4. Σ 3090. Lal. 27,568. 8.5
15h 3m 34s — 0° 35′.7.
9.1 and 9.4

1830.0	275°.5	1″.79	Σ	3 n
1868.6	277.0	1.59	Dembowski	4–3
1880.3	276.4	1.60	Cinc.	2
1885.3	275.9	1.72	L. McC.	1
1890.4	273.5	.....	Glasenapp	2

Fixed.

No. 5. Cordoba [38]. Bris. 5199. 8.2
15h 3m 47s — 40° 37′.5.
8.6 and 9.6

1878.5	N.f.	5″. ±	C. G. A.	1 n
1897.6	75°.7	5.22	See	1

Bris. 5200, mag. 8.4, is 7 secs. pr.

No. 6. h. 4734. Lac. 6236. MAG. 5.6 Yellow
15h 3m 48s — 54° 57′.9.
Comes = 11.8 blue

1835.8	241°.8	12″. ±	*h*	2 n
1887.5	244.8	11.3	Pollock	2
1897.2	246.3	11.4	See	1

Registered as a new pair by the last observer.

C. P. D. mag. = 7.4.

No. 7. β 809. B. D.—22°, 3908. 8.3
15h 4m 13s — 22° 20′.8.
8.6 and 10.2

1881.4	120°.1	1″.47	β	4 n
1888.5	123.5	1.75	Washburn	3
1892.4	119.2	1.64	Haverford	2
1898.3	121.0	2.04	See	1

No. 8. h. 4740. Ö.A. 14,309. 8.7
15h 4m 21s — 28° 4′.8.
9.2 and 9.7

1835.0	30°. ±	Very close	*h*	1 n
1884.3	357.9	0″.2 ±	Cinc.	1

No. 9. h. 4735. C. Z. 15 h. 186. 7.4
15h 4m 47s — 60° 0′.8.
Comes = 9.6

1835.3	29°.8	4″.50	*h*	2 n
1887.5	31.2	7.13	Pollock	3

No. 10. Dunlop 177. κ Lupi. 4.0
15h 4m 59s — 48° 21′.5.
4.2 and 5.9

1837.1	144°.2	27″.2	*h*	3 n
1847.1	144.8	27.2	Jacob	2
1876.5	144.1	27.3	Cape M.O.	3
1879.6	144.2	26.9	Hargrave	1

Common p.m. of 0″.139 towards 239°.7.

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No. 11. h. 4731. Gilliss P. Z. 10,721. MAG. 9.3
15h 5m 14s — 77° 30′.0.

9.6 and 10.8

1835.4	261.°1	1.″5 ±	*h*	1 n

h:—"The southern of three."

No. 12. Innes 238. Moesta 1283. 8.2
15h 5m 19s — 44° 38′.2.

8.4 and 10.3

1897.7	150.° ±	3.″ ±	Innes	1 n

The pr. of two stars.

No. 13. Washburn 121. Bris. 5212. 7.8
15h 5m 37s — 51° 39′.1.

8.0 and 9.5

1889.5	217.°3	2.″25	Pollock	3 n
1890.5	222.7	2.33	Sellors	1

Separately observed on the meridian at Cordoba in 1878, where the *comes* is put N.pr.

Closely N.f. the wide double star ζ Lupi, mag. 3.5.

No. 14. β 618. B. D.—19°, 4048. 9.0
15h 6m 35s — 19° 24′.9.

9.6 and 10.0

1878.3	24.°3	1.″86	β	4–3 n
1879.9	23.4	1.74	„	2
1885.3	19.8	1.40	Cinc.	2–1
1896.5	19.1	1.68	Lick	5

This pair is 57″ S.f. ι_1 Librae, mag. 4.9, and with it forms the old pair $\frac{H}{O}$ VI. 44.

No. 15. Cordoba [39]. Bris. 5217. 7.6
15h 6m 44s — 59° 26′.7.

7.8 and 9.8

1878.5	310.°6	5.″84	Cord. M.O. 1878	3 n
1897.2	215.8	2.16	See	1

In the C. G. A. the *comes* is No. 20,595, but its R. A. is 1 sec. in error.

No. 16. Innes 228. Bris. 5224. MAG. 7.7
15h 7m 18s — 43° 25′.1.

8.3 and 8.6

1897.7	225.° ±	1.″1 ±	Innes	3 n
1898.5	207.0	1.51	See	1

No. 17. h. 4742. C. Z. 15 h. 415. 6.9
15h 8m 50s — 75° 11′.7.

Comes = 12.2

1835.5	205.°6	15.″ ±	*h*	1 n

Mr Russell looked for the faint star on one night in 1872, but without seeing it.

C. P. D. mag. of the chief star = 8.0.

No. 18. Harvard. δ Circini. 5.3
15h 8m 52s — 60° 35′.2.

At Arequipa a companion within 30″ has been noted.

See *Harvard Circular*, No. 18.

No. 19. h. 4750. Lac. 6274. 7.3
15h 9m 20s — 47° 40′.4.

Comes = 11.8

1834.5	25.°5	12.″ ±	*h*	1 n

The p.m. of the chief star is 0″.7 towards 180°.

No. 20. Hargrave 113. C. Z. 15 h. 521. 8.6
15h 9m 28s — 59° 54′.7.

9.3 and 9.4

1883.6	343.°3	2.″52	Hargrave	1 n

The position given in the original catalogue is 7′ further south.

No. 21. λ 221. Bris. 5246. 7.5
15h 9m 31s — 36° 37′.5.

Comes = 13.9

1897.4	40.°8	4.″82	See	1 n

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No. 22. β 350. Lac. 6291. MAG. 6.9
15h 9m 41s — 27° 13′.5.

7.1 and 8.6

1876.5	163°.2	1″.32	Hall	2 n
1878.5	161.0	1.01	Cinc.	1
1880.4	157.5	1.23	,,	1
1882.4	160.1	1.41	,,	1
1886.5	157.7	1.28	Hall	3
1892.4	160.2	1.15	Haverford	2
1897.5	154.1	0.95	See	1

Fixed.

No. 23. Cordoba [40]. Bris. 5241. 7.8
15h 10m 0s — 53° 52′.0.

8.0 and 9.5

1889.5	143°.6	3″.06	Pollock	2 n

No. 24. Harvard. Lac. 6272. 5.4
15h 10m 46s — 60° 7′.7.

A companion within 30″.
Seen only, so far, at Arequipa.
See *Harvard Circular*, No. 18.

No. 25. Σ 3091. 1st Munich 11,133. 7.5
15h 10m 47s — 4° 31′.0.

Both = 8.3 yellow

1832.4	47.3	0″.5 ±	Σ	6 n
1843.9	35.9	0.50	Mädler	2
1863.5	45.?	obl. ?	Dembowski	1
1864.0	25.?	obl.	,,	1
1875.4	Single	.....	Hall	1
1878.4	45.0*	0.25 ±	β	1
1879.3	42.4	0.4 ±	Cinc.	2
1881.5	47.5	0.30	β	1
1890.4	46.8	0.35	,,	2

A binary system, wherein, in all probability, the plane of the orbit contains the line of sight.

As this pair is very close, any knowledge of the orbit will depend greatly on distance measures frequently made with the great refractors of the period.

No. 26. Σ 1925. W.B. 15 h. 153. MAG. 7.5
15h 11m 32s — 7° 54′.6.

7.7 and 9.2

1831.7	6°.7	4″.18	Σ	3 n
1848.5	7.3	4.19	Mitchel	1
1856.3	11.1	4.70	Secchi	3
1868.4	10.4	4.44	Dembowski	4
1877.4	10.1	4.87	Cinc.	2
1878.4	10.2	4.91	β	1
1879.3	10.6	4.76	Cinc.	3
1884.4	11.2	5.07	Hall	3
1890.4	10.7	5.59	Glasenapp	2–1

The distance is increasing.
There is a common p.m. of 0″.234 towards 206°.3.

No. 27. h. 4753. μ Lupi. 4.2
15h 11m 34s — 47° 30′.4.

4.8 and 5.2

1836.2	173°.5	2″.08	*h*	5 n
1847.8	174.1*	1.5 ±	Jacob	1
1851.5	170.1	1.5 ±	,,	4
1874.5	163.8	1.78	Russell	1
1879.7	161.5	1.98	Melbourne	1
1882.2	160.5	2. ±	Tebbutt	1
1894.5	158.8	1.10	Sellors	2
1897.1	155.5*	1.74	See	1

Angle [and distance] decreasing slowly.
Common p.m. of 0″.095 towards 212°.4.
Another star, 6.9 mag., makes up the old pair Dunlop 180, and has been measured as follows :—

1836.4	131°.3	22″.9	*h*	4 n
1847.8	128.6	22.1	Jacob	1
1876.5	127.8	24.3	Cape M.O.	4
1879.6	129.5	22.2	Hargrave	1
1897.1	130.2	23.4	See	1

Hargrave's measure is set against *h* 4752.
The three stars constitute a very pretty object, and probably form one system.

No. 28. h. 4755. C. Z. 15 h. 790. 8.5
15h 12m 59s — 36° 20′.1.

8.9 and 9.8

1834.3	203°.4	3″. ±	*h*	1 n
1848.1	209.3	3.99	Jacob	1
1882.5	201.8	4.32	Hargrave	1
1890.5	197.7	3. ±	Glasenapp	2
1897.4	202.3	4.22	See	1

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No. 29. β 227. Lac. 6317. MAG. 7.2
$15^h\ 13^m\ 17^s$ — 23° 54′.0.

7.3 and 9.7

1874.4	184°.1	1″.7 ±	β	1 n
1876.5	180.9	1.98	Cinc.	1
1878.4	180.0	1.98	,,	2
1886.3	177.5	2.28	L. McC.	1
1896.4	176.8	1.89	Scott	2
1898.3	175.0	2.25	See	1

Noted as double at the Cape in 1878.
Another double star is 31 secs. f.

No. 30. h. 4756. Lac. 6325. 7.3
$15^h\ 13^m\ 48^s$ — 23° 54′.3.

7.9 and 8.2 white

1835.4	180° ±	0″.7 ±	*h*	1 n
1877.0	329.9	1.17	Cinc.	2
1884.4	329.4	1.14	,,	1
1886.3	328.4	...	L. McC.	1
1892.4	327.6	0.98	Haverford	2
1898.5	323.1	0.95	See	1

h:—"Requires verification."
Also noted as β 228.
Perhaps in slow motion, and *h*'s angle = 360° ±.

No. 31. Cordoba [41.] Bris. 5277. 7.4
$15^h\ 14^m\ 40^s$ — 58° 48′.0.

7.5 and 10.0

1882.5	95°.5	6″.14	C. G. A.	3 n
1897.2	97.7	6.16	See	2

Several bright stars are near.

No. 32. Innes 86. Cor. D. M. —37°, 10,168. 9.5
$15^h\ 14^m\ 58^s$ — 37° 54′.3.

9.9 and 10.9

1896.3	pr.	1″. ±	Innes	1 n

Closely S.pr. Lac. 6329, a neat, easy pair.

No. 33. Howe 32. Lac. 6329. MAG. 6.7
$15^h\ 15^m\ 3^s$ — 37° 51′.4.

6.8 and 9.0

1880.6	121°.7	6″.27	C. G. A.	1 n
1885.3	121.2	5.79	Cinc.	1
1887.5	123.7	5.50	Pollock	2
1897.4	122.7	6.07	See	1

Noted as a double star at the Cape in 1877.

No. 34. λ 228. Lac. 6309. 5.6
$15^h\ 15^m\ 4^s$ — 60° 17′.8.

Comes = 12.7

1897.1	119°.6	6″.04	See	2 n

No. 35. h. 4757. γ Circini. 4.4
$15^h\ 15^m\ 25^s$ — 58° 57′.6.

5.1 and 5.2

1836.3	108°.5	1″.26	*h*	5 n
1871.4	[93.3]	[0.50]	Russell	1
1873.4	87.8	1.31	,,	1
1878.6	89.1	1.48	Melbourne	3
1880.5	91.4	0.5 ±	Cruls	1
1881.6	91.9	0.64	Hargrave	1
1891.6	80.0	1.06	Sellors	2
1897.1	84.8*	1.17	Lowell	3

A neat pair, binary in slow motion.
Common p.m. of 0″.09 towards 165°.

No. 36. λ 229. ϕ_1 Lupi. 3.3
$15^h\ 15^m\ 28^s$ — 35° 53′.9.

B = 14.3 C = 13.8

A and B

1897.4	239°.7	16″.74	See	1 n

A and C

1897.1	119°.3	17″.27	See	1 n

The p.m. of the chief star is 0″.130 towards 229°.2, and its mag. in the C. P. D. = 6.3.

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No. 37. Sellors 20. Bris. 5291. MAG. 8.5
15h 15m 40s — 47° 33′.3.

8.9 and 9.7

1895.6	217°.7	1″.62	Sellors	3 n
1897.2	214.5	1.43	See	2

Common p.m. of 0″.473 towards 236°.6.

The mag. which is from the C. G. A. is too faint.

Discovered independently in 1895 as Innes 38, and published some time before Mr Sellors' notification appeared. There being no delay, however, in the publication of the latter's result, the star is named as above.

Likely to be a binary in rapid motion.

No. 38. Copeland [2]. ε Lupi. 3.6
15h 15m 53s — 44° 19′.7.

3.8 and 6.0

1883.4	285°. ±	0″.8 ±	Copeland	1 n
1896.6	282.3	1.34	Sellors	3
1897.1	280.5	0.77	See	2

This fine pair was discovered by Dr Copeland whilst on the Andes, and has since been noted by several other observers, and published as new.

Another star, 10th mag. (Dunlop 182), has been measured as follows :—

1837.3	174°.9	26″.3	*h*	4 n
1896.6	173.0	26.6	Sellors	3
1897.1	172.0	26.7	See	1

The p.m. is very small.

No. 39. Harvard. Lac. 6308. 6.5
15h 16m 48s — 67° 57′.2.

Called double by the Arequipa observers. See *Harvard Circular*, No. 18.

No. 40. Innes 87. C. Z. 15 h. 1167. 9.2
15h 18m 48s — 38° 24′.2.

9.9 and 10.0

1896.9	S.pr.	1″.1 ±	Innes	3 n

k Lupi, mag. 4.6, is 90″ N.f., and has a faint *comes* 40″ ± N. It is, however, registered at Arequipa as having two or more *comites* within 30″. See *Harvard Circular*, No. 18.

No. 41. Harvard. Lac. 6376. MAG. 5.6
15h 20m 54s — 36° 25′.0.

Two *comites* within 30″ have been noted at Arequipa. See *Harvard Circular*, No. 18.

No. 42. Cape 16. Lac. 6370. 7.0
15h 21m 38s — 58° 0′.1.

7.4 and 8.4

1875.4	0°. ±	0″.6 ±	Cape	1 n
1890.5	24.1	2.04	Sellors	1
1891.5	22.2	1.97	,,	2

No. 43. Innes 239. U. A. 103 Lupi. 7.0
15h 22m 35s — 31° 7′.8.

7.5 and 8.0

1897.7	[0°. ±]	0″.6 ±	Innes	1 n

No. 44. h. 4771. C. Z. 15 h. 1417. 8.0
15h 22m 40s — 57° 45′.7.

Both = 8.8

1837.2	188°.1	5″.91	*h*	4 n
1873.5	184.1*	5.65	Russell	1

No. 45. λ 236. Anon. 9.0
15h 22m 46s — 38° 18′.3.

9.6 and 10.0

1897.1	247°.0	1″.49	See	2 n

This position is near Lac. 6388, mag. 6.8. There is no star here in either the Cor. D. M. or the C. P. D.

1899.4—Not found.

A similar pair is about 4m pr., 5′ S.

No. 46. β 1114. Lac. 6395. 6.8
15h 22m 54s — 28° 31′.1.

7.4 and 7.7

1889.4	325°.7	0″.65	*β*	3 n
1897.4	323.1	0.81	Aitken	3
1897.5	319.2	0.60	See	1

A 9.4 mag. star 9″ N.f. = C. Z. 15 h. 1470 makes up the old pair *h* 4774.

[contd.

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1834.4	8.5	10.″ ±	*h*	1 n
1877.4.	8.2	8.82	Cinc.	1
1880.4	6.5	9.17	,,	1
1897.4	5.4	8.90	Aitken	2
1897.5	4.2	9.25	See	1

No. 47. h. 4776. Lac. 6393. MAG. 6.6
15h 23m 40s — 41° 34′.4.

6.8 white, and 8.0 yellow

1835.9	224.2	5.95	*h*	2 n
1848.1	225.8	6.21	Jacob	1
1889.5	228.3	5.80	Pollock	2

No. 48. h. 4777. Lac. 6389. 6.7
15h 24m 52s — 57° 4′.0.

7.4 and 7.5, both white

1837.1	301.7	6.33	*h*	2 n
1872.4	300.3	6.03	Russell	1
1875.6	292.2	6.35	C. G. A.	3
1880.5	299.1	7.49	Cruls	1

This pair is identical with Cape 1840, 2038 + 39.
In the *Cape* 1880 *Catalogue* the companion was noted as equal to 10th mag., and by Cruls as 9th.

No. 49. Howe 34. Lac. 6405. 7.0
15h 25m 0s — 33° 28′.6.

7.2 and 8.7

1876.5	60.° ±	1.″2 ±	Howe	1 n
1878.5	Close double		Cape	3
1885.3	160.4	1.60	Cinc.	1
1898.4	155.0	2.37	See	1

No. 50. h. 4773. Bris. 5335. 8.7
15h 25m 12s — 74° 1′.1.

9.2 and 9.7

1835.5	267.°9	8.″ ±	*h*	1 n
1852.5	259.4	8.71	Gilliss, M. O.	2
1872.5.	252.4*	7.76	Russell	1
1878.5	244.9	6.46	Cape M.O.	2–1

The Dec. given by both *h* and Russell is about 20′ in error.
Considerable change, probably due to p.m. in one or both of the stars.
The position angle will decrease 1°.6 per century through precession.

No. 51. β 33. Lal. 28,246. MAG. 7.5
15h 25m 49s — 12° 38′.7.

7.6 and 9.9

1875.4	47.°5	2.″75	Dembowski	3 n
1878.5	44.1	2.90	Cinc.	1
1886.4	41.0	3.14	L. McC.	1
1892.4	42.1	3.08	Haverford	2

Doolittle has observed a star, 11.5 mag., 39″ S.
β 34 = B. D. – 12°,4269, mag. 9.5, a faint pair of 10th mag. stars, is 4′ S.f.

No. 52. Triple. Lac. 6420. 6.7
15h 27m 14s — 24° 9′.0.

A = 7.4 B = 8.3 C = 8.3

A and B + C = Lalande 123

1835.6	300.°5*	9.″55	*h*	5 n
1877.4	298.6	9.14	Cinc.	2
1890.4	298.6	8.72	Glasenapp	2
1897.5	299.1*	9.23	See	1

Also registered as South 673.
Separately observed in several meridian catalogues.

B and C = λ 238

1897.5	137.°8	0.″20	See	1 n

No. 53. Innes 240. Lac. 6399. 7.2
15h 27m 17s — 64° 46′.6.

7.4 and 9.4

1897.5	200.° ±	1.″7 ±	Innes	1 n

No. 54. Innes 241. C. Z. 15 h. 1800. 8.0
15h 28m 27s — 64° 11′.8.

8.2 and 10.2

1897.7	270.° ±	1.″5 ±	Innes	1 n

A fainter star S.f. 8″ ±.
C. Z. 15 h. 1797, mag. 8.5, is 80″ S.

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No. 55. h. 4786. γ Lupi. MAG. 3.0
15h 28m 28s — 40° 49′.8.

3.7 and 3.9

1835.0	94°.3	0″.8 ±	*h*	9 n
1837.0	93.8	0.7 ±	„	6
1853.1	273.4	1.03	Jacob	2
1856.2	275.4	0.75 ±	„	3–2
1877.4	Plainly elongated		Melbourne	1
1871 } 1887 }	Perhaps elongated in 270° or 90°	...	Russell Pollock	8 1
1895.6	Single	...	Sellors	3
1896.0	„	...	Innes	2
1897.1	91°.7	0″.38	Lowell	3

Common p.m. of 0″.072 towards 238°.9.

This star was not seen double, for certain, from 1856–1897, when it was seen by Prof. See, who, however, misidentified it as β Lupi, and it was thus registered as a new pair. See *Popular Astronomy*, vol. iv., where it is called "the finest close double in the entire heavens!"

It was clearly divided with the 18-in. McClean Refractor in 1898.

There are really no data on which to found an orbit. It may be suggested that the period is about eighty years, and that duplicity is only visible when the stars are in apastron.

Paper:—

1897. See *M. N. R. A. S.*, vol. lviii. pp. 15–18.

No. 56. h. 4788. *d* Lupi. 4.8
15h 29m 0s — 44° 37′.4.

4.9 and 7.8

1836.6	349°.0	3″.14	*h*	4 n
1852.0	353.5	2.62	Jacob	3
1877.5	358.0	2.55	Melbourne	2
1880.6	356.1	1.98	Hargrave	1
1895.5	358.7	2.14	Sellors	3
1897.1	9.1	2.40	See	1

Slow increase in angle, and diminution in distance.

The p.m. is very small.

Formerly called *f* Lupi.

A pretty pair.

No. 57. Harvard. κ_2 Apodis. 5.8
15h 29m 16s — 73° 7′.0.

Two *comites* within 30″ have been noted at Arequipa. See *Harvard Circular*, No. 18.

No. 58. h. 4780. C. P. D.—80°, 779. MAG. 9.0
15h 30m 45s — 80° 13′.2.

9.6 and 9.9

1836.00	270°.6	2″.8 ±	*h*	2 n
1874.46	271.9	5.62	Russell	1
1874.52	271.1	5.72	„	1
1880.52	273.9	6.42	„	1
1880.52	274.0	4.70	„	1

Near a 10″ pair = *h* 4787 = Gilliss P. Z. 11,125 + 7.

Mr Russell's 2nd and 3rd measures are set against Russell 262, his last against Russell 265—the pair being called new on those occasions.

No. 59. λ 241. Cor. D. M.—23°, 12,411. 9.7
15h 30m 55s — 23° 20′.9.

Comes = 13.2

1897.5	27°.3	0″.97	See	1 n

No. 60. Innes 242. C. Z. 15 h. 2046. 7.5
15h 31m 14s — 31° 11′.7.

8.1 and 8.4

1897.7	45°	1″.5 ±	Innes	2 n

The preceding star of a group of five, each of which is double.

No. 61. Innes 88. C. P. D.—51°, 8319. 9.6
15h 31m 17s — 52° 3′.0.

Comes = 10.1

1897.2	341°.0	2″.10	See.	1 n

This pair and Lac. 6437, mag. 5.4, 5 secs. f., compose the old pair Dunlop 189.

No. 62. Harvard. ω Lupi. 4.0
15h 31m 19s — 42° 14′.3.

Comes = 11.7

1897.1	27°.0	11″.7	See	1 n

Noted as double at Arequipa.

See *Harvard Circular*, No. 18.

ω Lupi has a p.m. of 0″.238 towards 297°.5.

C. P. D. mag. = 6.6.

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No. 63. Innes 243. C. Z. 15 h. 2073. MAG. 7.2
15h 31m 40s — 30° 55′.3.

7.7 and 8.2

1897.4	5.7	0.″59	See	1 n

See also Nos. 60 and 67.
First found by See, his λ 242.*

No. 64. Harvard. Lac. 6448. 5.9
15h 32m 7s — 38° 47′.9.

Noted as double at Arequipa.
See *Harvard Circular*, No. 18.
C. P. D. mag. = 7.1.

No. 65. β 121. Lac. 6469. 8.3
15h 33m 32s — 27° 19′.0.

9.0 and 9.1

1877.0	278.6	1.″67	Cinc.	2 n
1879.3	277.0	1.62	,,	1
1888.5	274.0	1.5 ±	Haverford	1
1889.5	277.5	1.45	β	3
1890.5	281.8*	1.6 ±	Glasenapp	2
1898.4	280.0	1.95	See	1

No. 66. Σ 3094. Lal. 28,492. 8.7
15h 33m 43s — 8° 14′.5.

9.0 and 10.2

1831.6	295.6	2.″38	Σ	5 n
1870.0	298.3	2.31	Dembowski	5
1879.3	298.1	2.49	Cinc.	2

Σ 1962, a 12″ pair, first observed by Ḥ or Lalande, is about 20′ S.pr.

No. 67. Innes 244. C. Z. 15 h. 2214. 8.2
15h 33m 47s — 31° 3′.7.

8.8 and 9.1

1897.5	27.1	1.″09	Lowell	2 n

Found independently as λ 243.
In a group of five stars in the finder, all of which are double. See Nos. 60 and 63.*
The brightest star of the group, Lac. 6473, mag. 6.9, is noted as double in the C. P. D.; it having a faint *comes* beyond the limits of inclusion in this catalogue.

No. 68. Howe 38. Lal. 28,483. MAG. 8.2
15h 33m 52s — 20° 41′.4.

8.4 and 9.9

1876.3	190.° ±	1.″5	Howe	1 n
1892.5	197.9	2.22	Hough	3
1898.3	197.3	2.80	See	2

A star, 5.8 mag. (C. P. D. = 6.9), is 84 secs. pr. 0′.3 N.
Also registered as Hough 395, Howe's R.A. being 5m too great.

No. 69. β 122. Lal. (28,495). 7.6
15h 34m 8s — 19° 26′.6.

8.2 and 8.6

1868.5	202.°5*	2.″09	Harvard	1 n
1875.4	204.0	1.76	Dembowski	4
1877.4	205.4	1.91	Cinc.	2
1887.4	205.8	1.75	Tarrant	2
1888.4	206.9	1.96	Haverford	3
1890.4	206.1*	2.03	Glasenapp	2
1894.5	207.9	1.67	Sellors	2

Also observed on the meridian at Berlin, where the magnitudes are reversed. One of the stars may be variable.
Also registered as Harvard 140.

No. 70. Innes 89. Lac. 6471. 6.8
15h 34m 29s — 39° 39′.4.

7.0 and 8.5

1896.3	S.f.	1.″ ±	Innes	1 n
1897.2	154°.1	0.89	See	2

The p.m. is insensible.

No. 71. Washburn 25. B. D.—14°, 4256. 9.2
15h 34m 43s — 14° 12′.2.

9.8 and 10.1

1881.4	313.8	1.″24	Washburn	3 n
1888.5	311.8	1.42	,,	3

* Note to Nos. 63 and 67. I detected these two pairs, together with No. 60, in Sept. 1897; but, after publication, I learned that Professor See had already found the two former in June 1897, as well as another pair S. f., his λ 244 (R. A. 15h 35m 30s. S. D. 31° 31′.5), which has been accidentally omitted, but it will be found in the additions at the end. It is curious that in this group of stars, all the companions are in the N. f. quadrant.

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No. 72. Dunlop 190. Bris. 5413. MAG. 8.3
15h 34m 57s — 57° 47′.6.

8.5 orange, and 10.0 blue

1834.3	94.7	5.″ ±	*h*	1 n
1871.5	91.9	6.75	Russell	1
1878.4	103.7*	7.17	C. G. A.	4

h and Russell call the chief star about 7th mag.; and in the C. G. A. the magnitudes are reversed.

No. 73. λ 245. C. Z. 15 h. 2441. 8.3
15h 36m 35s — 34° 22′.4.

9.0 and 9.1

1897.2	168.0	0.″35	See	2 n

ψ_2 Lupi, mag. 4.8, is 17 secs. pr.

No. 74. h. 4795. Lac. 6472. 7.4
15h 36m 51s — 58° 48′.3.

Comes = 9.8

1836.0	224.3	7.″ ±	*h*	2 n
1881.6	219.3	6.76	Hargrave	1

No. 75. β 35. Piazzi 15 h. 150. 7.3
15h 37m 9s — 15° 41′.6.

7.4 and 9.8

1875.4	99.2	2.″40	Dembowski	4 n
1877.4	97.3	2.51	Cinc.	2
1887.4	98.0	2.28	Tarrant	2
1890.4	102.4	2.64	Glasenapp	2–1
1898.3	99.3	2.56	See	1

η Librae, mag. 5.5, is 30′ N.f.
Noted as double at Cordoba in 1879.

No. 76. β 354. Piazzi 15 h. 149. 7.2
15h 37m 12s — 25° 5′.8.

7.4 and 9.0

1876.9	285.6	5.″27	Cinc.	2 n
1890.4	287.7	5.32	Glasenapp	2

Separately observed on the meridian at Cordoba in 1879.

No. 77. Howe 37. Lac. 6493. MAG. 6.5
15h 37m 38s — 41° 30′.0.

6.7 and 8.9

1883.7	350.° ±	4.″ ±	Hargrave	1 n
1890.4	354.9	4.5 ±	Glasenapp	2
1890.5	349.4	4.12	Sellors	1
1891.5	346.0	3.48	,,	1
1897.3	348.4	3.92	See	2

Also registered as Hargrave 121.
First seen by Howe in 1876; also noted at the Cape and Cordoba in 1877–8.

No. 78. Washburn 124. Lac. 6488. 6.7
15h 37m 40s — 50° 28′.1.

6.9 and 8.7

1890.5	213.7	2.″26	Sellors	2 n
1895.5	207.2	2.50	,,	3
1897.1	206.0	2.52	See	2

Duplicity noted at Cordoba in 1874.

No. 79. λ 248. Lac. 6503. 7.7
15h 38m 42s — 34° 47′.1.

Both = 8.5

1897.5	190.° ±	0.″2 ±	See	1 n

No. 80. Rumker 20. Lac. 6477. 5.8
15h 38m 46s — 65° 7′.7.

6.5 and 6.6

1835.3	155.9	2.″42	*h*	3 n
1876.0	152.8	2.70	Russell	2
1879.6	154.2	1.56	Hargrave	1
1887.7	152.1	2.25	Tebbutt	8
1890.6	152.0	1.85	Sellors	2

Fixed, but the measures are not accordant for so easy a pair.
If there is any p.m., it is inconsiderable.
This is erroneously catalogued twice in Mr Russell's catalogue, once as a new pair = Russell 267, and again as *h* 4799.
Noted as being triple at Arequipa.

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No. 81. Σ 3095. W.B. 15 h. 705. MAG. 8.3
15h 39m 23s — 14° 51′.7.

8.6 and 9.9

1831.3	349°.7	2″.85	Σ	3 n
1869.4	337.5	2.84	Dembowski	5
1879.4	335.8	2.96	Cinc.	4
1880.5	339.4	2.87	Pritchett	3
1890.5	336.6	3.92	Glasenapp	2–1

Other measures.

No. 82. Innes 245. Bris. 5461. 7.5
15h 40m 1s — 43° 55′.9.

7.7 and 9.4 orange

1897.6	N.pr.	1″.±	Innes	1 n

Lac. 6519, mag. 7.2, is 1m 20s f. and 7′ S.

No. 83. β 620. Lac. 6516. 6.7
15h 40m 8s — 27° 44′.9.

7.4 and 7.7

1878.4	166°.8	0″.86	β	1 n
1892.4	165.5	0.65	Haverford	1
1892.4	154.4	0.50	β	3
1896.5	170.2	0.72	Lick	1
1896.5	174.5	0.63	Leavenworth	3

C. Z. 15 h. 2696, mag. 9.3, 51″ S.pr., makes up the old pair *h* 4803.

No. 84. λ 249. Lac. 6521. 6.5
15h 40m 59s — 37° 36′.0.

Comes = 14.0

1897.5	130°.2	15″.2	See	2 n

Another companion, distant 25″, has been noted at Arequipa, and measured by Prof. See.

See *Harvard Circular*, No. 18.

The p.m. of Lac. 6521 is 0″.588 towards 240°.4.

No. 85. Howe 39. C. Z. 15 h. 2083. 8.0
15h 41m 28s — 35° 24′.5.

8.5 and 9.0

1876.2	330°.±	1″.3 ±	Howe	1 n

No. 86. Innes 90. Lac. 6530. MAG. 7.3
15h 41m 55s — 25° 40′.6.

Comes = 10.4

1896.7	10°.±	1″.±	Innes	1 n

Ö.A. 14,870, mag. 8.5, is a little way N.pr.

No. 87. Cinc. Ö.A. 14,882. 8.8
15h 42m 3s — 19° 23′.5.

Both = 9.6

1885.3	0°.±	0″.5 ±	Cinc.	– n

No. 88. Dunlop 193. Lac. 6524. 5.7
15h 43m 20s — 54° 45′.0.

Comes = 9.1

1835.4	22.4	24.0	*h*	1 n
1837.3	21.4	22.7	,,	1
1871.6	18.8	21.4	Russell	1
1880.7	18.2	21.5	Hargrave	1

Called *h* 4807 by Mr Russell in error.

According to the Arequipa observers, this is a triple system, and according to *h*, quadruple—viz., "two more companions forming a curve."

No. 89. Σ 1974. Lal. 28,787. 8.2
15h 43m 59s — 2° 55′.7.

8.9 and 9.1

1831.4	166°.0	2″.61	Σ	3 n
1848.5	165.1	2.44	Mitchel	1
1886.3	162.9	32.52	L. McC.	1
1890.4	163.3	2.72	Glasenapp	2

Σ 3126, a fainter pair, is a little way N.f.

No. 90. λ 250. C. Z. 15 h. 3019. 8.0
15h 44m 30s — 34° 44′.6.

8.5 and 9.1

1897.5	100°.7	0″.56	See	1 n

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No. 91. Sellors 11. Lac. 6540. MAG. 6.4
15h 46m 25s — 60° 26′.7.

6.6 and 8.1

1891.5	97°.1	0″.56	Sellors	2 n
1893.5	93.9	1.00	,,	1
1895.5	91.4	1.09	,,	3
1897.1	95.2	1.19	See	1

The chief star of the 44″ double *h* 4809.

Finely situated near the middle of a triangle of 9th mag. stars.

Prof. See associates my name with this pair—an inadvertence, probably, as I do not remember making any reference to it.

No. 92. h. 4813. Lac. 6546. 6.1
15h 47m 10s — 59° 52′.7.

6.2 yellow, and 9.7 blue

1836.5	96°.8	2″.±	*h*	1 n
1871.5	98.9	3.34	Russell	3
1880.7	100.5	2.66	Hargrave	1
1890.5	96.8	4.05	Sellors	1
1897.1	98.9	3.65	See	2

Sometime called κ Circini.

The Sydney measure of 1890 is credited to Lac. 6550 in error.

A third star was seen at Arequipa in 1891.

No. 93. Dunlop 195. Lac. 6561. 6.8
15h 47m 28s — 50° 2′.4.

7.4 and 7.7

1836.4	10°.7	12″.28	*h*	3 n
1848.1	9.4	12.01	Jacob	1
1873.5	7.7	1.58	Russell	1
1876.5	12.3	12.31	Cape M.O.	3

Although the position given by Mr Russell is that of Dunlop 195, he calls the star *h* 4815, a 15″ pair 15° away.

The mags. given by Mr Russell are 8.0 and 12.0, and the night was noted as hazy. Hence it is uncertain if the measure given applies to this pair.

No. 94. β 36. A Scorpii. MAG. 4.7
15h 47m 36s — 25° 1′.7.

4.8 yellow, and 8.0

1877.4	277°.2	2″.53	Cinc.	1 n
1878.5	279.0	2.58	,,	2
1881.4	272.7	2.88	,,	2
1885.9	279.3	2.84	,,	2
1892.4	277.8	2.86	Haverford	2
1894.6	276.6	1.94	Sellors	2
1897.5	274.4	2.93	See	1

Mr Sellors' distance looks like a misprint for 2″.94.

The p.m. of the chief star is 0″.045 towards 251°.7, and is evidently shared by the *comes*.

The companion was well seen by several observers during the series of occultations of this star which occurred in 1896.

No. 95. Σ 3099. W.B. 15 h. 887. 8.4
15h 49m 3s — 13° 23′.3.

8.7 and 10.0

1831.1	112°.2	1″.88	Σ	4 n
1867.5	116.7	2.35	Dembowski	3–2
1879.4	113.9	2.20	Cinc.	6–3

No. 96. Harvard. Lac. 6582. 6.5
15h 49m 25s — 39° 34′.2.

A companion within 30″ has been noted at Arequipa. See *Harvard Circular*, No. 18.

No. 97. Piazzi. ξ Lupi. 5.1
15h 50m 30s — 33° 40′.4.

5.6 and 6.2

1835.5	49°.3	11″.0	*h*	3 n
1857.5	47.4	10.7	Secchi	1
1892.5	49.9	10.8	Scott	1
1897.1	48.4	10.6	See	2

Fixed.

The p.m. is very small.

Separately observed on the meridian frequently.

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No. 98. ℍ. II. 85. **Lal. 28,987.** MAG. 7.0
15h 50m 44s — 1° 52′.2.
7.3 and 8.7

1783.3	316°.2	″.....	ℍ	1 n
1831.9	326.6	5.42	Σ	4
1858.4	330.1	5.61	Morton	3
1877.5	331.7	5.66	Cinc.	2
1890.4	334.9	5.66	Glasenapp	2
1896.5	336.6	5.79	Hussey	3

Also called Σ 1985.
Many other measures.
The angle is increasing by 0°.18 per an.

No. 99. **Russell 269.** **Anon.** 8.5
15h 51m ...s — 65° 42′.
9.0 and 9.5

1872.6	134°.2	″2.43	Russell	1 n
1881.5	131.3	1.91	„	1

Not identified.*

No. 100. **λ 252.** **C. Z. 15 h. 3468.** 8.4
15h 51m 4s — 40° 42′.3.
A = 9.1 B = 9.2 C = 12.6
A and B

1897.2	281°.5	″0.37	See	1 n

A + B and C

1897.2	214°.7	″18.43	See	1 n

No. 101. **Rumker 21.** **η Lupi.** 3.8
15h 53m 30s —.38° 6′.6.
Comes = 7.8

1834.7	22°.2	″15.1	*h*	3 n
1846.6	20.3	15.2	Jacob	1
1857.5	21.0	15.4	Secchi	1
1879.6	21.0	7.1	Hargrave	1
1881.7	20.3	14.9	Tebbutt	1
1886.6	19.8	15.3	„	2
1890.4	20.7	15.0	Glasenapp	2
1890.5	21.0	6.±	Sellors	1
1897.2	20.9	14.7	See	3

Excluding the discordant Sydney distances, there is no sign of change.
The p.m. is inconsiderable.
Separately observed on the meridian at Cordoba.

No. 102. **Σ 3101.** **Lal. 29,070.** MAG. 7.9
15h 53m 41s — 2° 47′.3.
8.5 and 8.8

1831.8	60°.3	″2.04	Σ	4 n
1868.2	62.1	2.10	Dembowski	4
1879.3	58.7	2.24	Cinc.	2
1890.4	66.0	2.72	Glasenapp	2

Common p.m. of 0″.3.

No. 103. **Howe 40.** **C. Z. 15 h. 3680.** 7.7
15h 54m 0s — 35° 48′.3.
8.1 and 9.1

1876.2	100°.±	″4.±	Howe	1 n
1877.5	100.0	6.99	„	1
1897.4	101.8	6.70	See	1

No. 104. **λ 254.** **Bris. 5555.** 7.7
15h 54m 2s — 46° 15′.3.
7.9 and 10.0

1897.2	193°.7	″1.11	See	1 n

(Seen).

No. 105. **Cordoba [42.]** **Lac. 6625.** 6.4
15h 54m 9s — 40° 9′.2.
6.5 and 9.8

1880.5	171°.9	″9.80	C. G. A.	2 n
1889.5	156.5	8.36	Pollock	2
1897.2	158.1	7.91	See	2

The first measure is (as usual in measures marked C. G. A.) derived from the meridian results, and is probably somewhat rough.

No. 106. **Triple.** **ι_1 Normae.** 4.8
15h 55m 24s — 57° 29′.6.
A = 5.6 B = 5.8 C = 9.0
A and B both yellow = λ 258

1897.1	266°.1	″0.84	See	2 n

A + B and C = *h* 4825

1835.4	251°.2	″15.±	*h*	1 n
1871.5	249.3	10.32	Russell	1
1897.1	249.6	10.95	See	2

The common p.m. of the close pair is about 0″.1 towards 220°. It is doubtful if C shares in it.
Also noted as triple at Arequipa. See *Harvard Circular*, No. 18.
Mags:—A + B = 9, C = 11. Russell, 1871.

* This star is identical with C.Z. 15h. 3258, R. A. 15h 48m 46s, Dec. − 65° 18′.0. Mags. = 9.2 and 9.7; combined = 8.7.
Russell 268 = C.Z. 15h. 3228, mag. 8.5, is a wide pair 18″ N. pr. in the same field. The positions given by Mr Russell are much in error. (1899, May 11.)

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No. 107. λ 259. Lac. 6641. MAG. 7.1
15h 55m 32s — 36° 27′.7.

7.8 and 7.9

1897.4	17°.7	0″.2 ±	See	1 n

No. 108. Cordoba [43]. C. G. A. 21,713+4. 8.0
15h 55m 47s — 37° 46′.4.

8.7 and 8.9

1877.6	S.f.	6″. ±	C. G. A.	3 n

No. 109. β 623. Lac. 29,127. 8.4
15h 55m 55s — 6° 41′.4.

8.8 and 9.6

1878.5	238°.4	0″.97	β	1 n
1878.7	236.8	0.99	Cinc.	3
1888.3	237.8	1.01	Haverford	1

No. 110. β 37. C. Z. 15 h. 3846. 9.0
15h 56m 27s — 24° 18′.1.

Comes = 9.9

1879.4	40°.9	2″.79	Cinc.	1 n
1891.5	44.6	2.69	β	3
1892.4	43.4	3.09	Haverford	3

No. 111. β 38. Lal. 29,136. 7.5
15h 56m 51s — 24° 44′.1.

Comes = 9.1

1877.5	352°.0	3″.95	Cinc.	1 n
1880.5	351.5	4.07	,,	1
1891.5	352.9	4.52	β	3

No. 112. Howe 41. Lac. 6653. 7.1
15h 57m 27s — 32° 47′.5.

7.8 and 8.0

1875.5	363°.8	1″.90	C. G. A.	4 n
1877.4	346.7	2.77	Cinc.	1
1897.4	345.4	3.00	See	1
1897.4	344.8	2.47	Scott	4

Also noted as double at the Cape in 1878.

No. 113. h. 4828. C. Z. 15 h. 3929. MAG. 8.5
15h 57m 42s — 43° 3′.9.

Comes = 10.4

1834.6	90°.7	3″. ±	*h*	1 n

No. 114. Harvard. Lac. 6657. 6.4
15h 58m 1s — 37° 35′.0.

1891 Double within 30″. Arequipa.
1897.7 Single, 7-inch refractor, Cape 1 n

No. 115. λ 262. C. Z. 15 h. 3957. 9.0
15h 58m 3s — 40° 7′.6.

9.5 and 10.0

1897.6	328°.8	1″.01	See	1 n

No. 116. Triple. ξ Scorpii. 4.1
15h 58m 52s — 11° 5′.8

A = 4.6 B = 5.5 C = 7.1

A and B = H. I. 33

1782.4	188°.0	″...	H	1 n
1825.5	355.3	1.15	Σ	3
1834.5	7.1	1.17	Dawes	4
1842.5	21.6	.....	,,	2
1856.2	65.5	0.60	Jacob	3
1865.5	166.9	0.49	Engelmann	7
1875.4	180.5	1.10	Dembowski	5
1884.5	194.6	1.28	Hall	5
1892.5	208.0	1.23	Maw	3
1895.5	213.4	0.81	Comstock	3
1899.5	225.6	0.74		
1900.5	229.6	0.70		

The above measures and ephemeris are taken from Prof. See's *Evolution of Stellar Systems.*

According to Prof. See the orbit of this well-known binary is :—

P = 104 years T = 1864.6
$a = 1''.36$
$e = 0.131$ $i = 70°.3$
$\Omega = 9°.5$ $\lambda = 111°.6$

The orbit is much less elliptical than usual in binary systems.

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From the inclination of the orbit and the position of λ there are two maxima and two minima in the distances in each revolution, they occur approximately as follows :—

1835	1".42
1860	0.38
1884	1.29
1912	0.50

The common p.m. is 0".098 towards 258°.8.

A(+B) and C = ℍ. II. 20

1782.3	88°.6	6".38	ℍ	1 n
1822.5	78.4	6.77	*h*	–
1832.5	76.2	6.70	Σ	3
1836.5	74.7	7.07	,,	3
1852.2	74.7	6.99	OΣ	–
1854.1	69.3	7.73	Jacob	2–1
1862.7	70.5	7.15	Dembowski	5
1867.8	70.0	7.03	,,	5
1871.8	61.6	7.12	,,	5
1876.5	67.3	7.30	Hall	2
1880.5	65.2	7.29	Pritchett	3
1888.6	65.3	7.17	Hall	2

It will be thus seen that whilst the motion of the close pair is direct, that of the third companion is retrograde. Its distance is perhaps increasing. Many other measures.

Sometimes called ξ (51) Librae in error.

Also called Σ 1998.

Paper :—

1893. Hall, A., *Ast. Journal*, vol. xiii. No. 302.

No. 117. λ 264. C. Z. 15 h. 4048. MAG. 8.0

15h 59m 21s — 32° 34′.9.

A = 8.2 B = 9.7 C = 12.7

A and B

1897.5	340°.0	0".55	See	1 n

A and C

1897.5	9°.8	9".96	See	1 n

The brightest star of a small group.

No. 118. Washburn 127. B. D. −20°, 4395. MAG. 9.1

15h 59m 36s — 20° 13′.2.

Comes = 11.5

1889.5	131°.1	2".00	Washburn	2 n

B. D. − 20°, 4394, mag. 9.5, is N.pr., and a 7.7 mag. star is 12s f. and N.

No. 119. Triple. β Scorpii. 3.1

15h 59m 37s — 19° 31′.9.

B = 10.1 C = 6.4

A and B = β 947

1879.6	97°.3	0".85	Hall	1 n
1880.1	88.4	0.91	β	6
1881.5	92.7	0.96	,,	3
1887.6	99.2	1.09	Hall	2
1889.4	93.9	0.94	β	5
1891.5	95.7	1.00	Hall	2
1892.4	95.8	1.03	β	3
1897.6	90.6	1.00	Aitken	3
1898.3	93.4	1.13	See	1

A and C = ℍ. III. 7

1782.3	25°.1	[14".4]	ℍ	1 n
1823.3	26.5	13.7	South	2
1852.7	25.4	13.7	Jacob	3–2
1868.4	25.5	13.7	Dembowski	4
1879.6	24.3	13.8	Cinc.	7
1880.5	25.2	13.4	β	3
1890.4	23.0	13.3	Glasenapp	2
1896.5	25.3	13.6	Hussey	3

Virtually fixed.

This great triple system has a common p.m. of 0".046 towards 233°.7.

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No. 1. β 948. Lal. 29,280. MAG. 6.4
16h 0m 24s — 6° 1′.2.
6.5 and 9.1

1879.6	150°.5	1″.47	β	4 n
1888.5	147.4	1.55	Haverford	2
1892.4	149.3	1.54	„	4–3

Two more distant *comites* have been noted by Σ and others.

Curiously enough, *h*, in observing the distant stars, in 1835, remarks, "The large star not noticed as close double." Why this remark was made is not apparent.

No. 2. Harvard. Piazzi 15 h. 255. 6.5
16h 0m 41s — 36° 29′.0.

1891	Double 13-inch.	Arequipa
1897	Single 7-inch.	Innes

See *Harvard Circular*, No. 18.

No. 3. β 39. 11 Scorpii. 5.6
16h 2m 3s — 12° 28′.6.
Comes = 10.5

1872.5	258°.2	3″.75	Knott	1 n
1875.7	256.5	3.35	Dembowski	4
1879.5	258.4	3.33	β	2
1882.4	254.6	3.36	Cinc.	2
1888.4	259.4	3.33	Haverford	1

Common p.m. of about 0″.07.
A few other measures.

No. 4. β 949. Lal. 29,365. 6.5
16h 2m 59s — 9° 49′.9.
7.2 and 7.3

1880.3	197°.8	0″.62	β	4 n

This fine pair seems to have met with unmerited neglect.

No. 5. Brisbane. Lac. 6706. 6.6
16h 3m 10s — 32° 23′.0.
7.3 and 7.4

1837.5	86°.4	15″.±	*h*	1 n
1890.4	86.5	6.86	Glasenapp	2
1897.4	85.2	7.85	See	1

Both stars have been observed on the meridian at the Cape and Cordoba.
A 9.1 mag. star 5′ S.f.

No. 6. Harvard. Piazzi 15 h. 271. MAG. 6.0
16h 3m 28s — 33° 16′.8.

1891	Double 13-inch refractor.	Arequipa
1897	Single 7-inch „	Innes

From *Harvard Circular*, No. 18.

No. 7. λ 266. Lac. 6708. 7.2
16h 3m 29s — 35° 22′.6.
7.5 and 8.7

1897.4	206°.±	0″.2 ±	See	1 n

No. 8. Cordoba [44]. Bris. 5620. 8.3
16h 5m 21s — 56° 9′.4.
8 5 and 10.0

1879.6	150°.3	2″.53	C. G. A.	3 n

No. 9. λ 267. C. Z. 16 h. 278. 7.5
16h 5m 22s — 42° 6′.9.
Comes = 14.2

1897.6	189°.2	4″.92	See	1 n

Another star 40″ pr.

No. 10. Harvard. κ Normae. 5.1
16h 5m 35s — 54° 22′.3.
Comes = 13.9

1897.2	209°.8	17″.5	See	3 n

From *Harvard Circular*, No. 18.
C. P. D. mag. = 7.4.

No. 11. β 40. Ö.A. 15,343. 8.0
16h 5m 42s — 27° 17′.5.
8.5 and 9.0

1876.5	352°.1	5″.22	Cinc.	1 n
1877.5	354.8	4.69	„	1
1890.5	354.7	5.71	Glasenapp	2
1891.5	355.2	5.07	β	4

Separately observed on the meridian at Cordoba.
This is β's first discovery.

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No. 12. h. 4839. c_1 Scorpii. MAG. 5.5
16h 6m 5s — 28° 9′.4.

5.6 and 8.6

1834.8	81.°7	4.″62	*h*	2 n
1876.5	82.2	4.50	Cinc.	2
1880.4	77.2	4.36	„	2
1890.5	79.7	4.03	Glasenapp	2
1897.4	77.4	4.42	Scott	3

C. P. D. mag. = 6.6.
About 30′ S. of c_2 Scorpii, mag. 4.7.

No. 13. Jacob [9.] Piazzi 16 h. 3. 7.3
16h 6m 10s — 19° 11′.4.

7.7 and 8.7

1846.6	39.°0	1.″11	Mitchel	2 n
1847.7	43.8	1.7 ±	Jacob	2
1850.6	41.0	2.13	„	3–2
1868.5	41.3	2.03	Harvard	1
1874.4	45.7	.....	*β*	6
1874.5	48.4	1.89	Dembowski	2
1876.3	47.4	1.90	„	2
1877.4	46.2	1.86	Cinc.	1
1879.4	45.2	2.07	„	5
1881.3	46.6	2.02	*β*	4
1887.6	47.8	2.00	Hall	5
1888.4	48.3	2.22	Haverford	3
1890.4	47.5	2.58	Glasenapp	2
1896.6	47.3	2.22	Hussey	2
1896.6	51.0	2.09	Pritchett	3
1897.5	43.6	2.05	Aitken	3
1898.3	47.5	2.30	See	1

The angle and distance are perhaps increasing slowly.

Other measures.

The pr. and N. star of a quadruple system. Connecting the two pairs there are many measures, some of which are quoted (Ⱨ. V. 6).

1782.3	334.°8	″	Ⱨ	1 n
1821.4	338.2	40.8	South	–
1847.7	336.6	40.6	Jacob	2
1851.4	336.8	40.8	Smyth	–
1874.5	336.8	40.8	Dembowski	4
1888.6	336.4	40.8	Hall	2

No. 14. β 120. ν Scorpii. MAG. 4.2
16h 6m 11s — 19° 12′.1.

4.4 and 5.9

1875.9	359.°9	0.″73	Dembowski	11–6 n
1877.5	8.9	0.59	Cinc.	2–1
1878.4	359.4	0.52	Russell	2
1878.5	0.6	0.72	Dembowski	2
1879.0	0.2	0.74	Cinc.	5
1880.5	0.9	0.54	Pritchett	12
1881.4	6.7	0.81	*β*	6
1886.2	7.2	0.65	L. McC.	1
1886.4	3.9	0.74	Hall	3
1888.4	4.1	0.80	Haverford	3
1888.6	5.0	0.60	Hall	2
1889.4	1.2	0.80	*β*	3
1896.5	3.5	1.15	Hussey	1
1896.6	7.4	0.88	Pritchett	2
1897.5	0.6	0.71	Aitken	3
1898.3	3.4	1.32	See	1

Other measures.

The angle and distance are probably increasing, but the measures of both this and the pair N.pr. are puzzling. The discordances are in excess of the probable errors.

Also registered in the first list of new double stars discovered at the Sydney Observatory.

The common p.m. of this quadruple system is very small (0″.04 about), and is the same in amount and direction as that of several neighbouring stars, *e.g.*, 48 and 50 Librae, *ψ* Ophiuchi, etc.

See:—
Burnham, *M. N. R. A. S.*, vol. xxxv. pp. 28–30.

No. 15. Russell 274. δ Triang. Austr. 4.0
16h 6m 20s — 63° 25′.8.

Comes = 10.3

1880.4	140.° ±	0.″3 ±	Russell	1 n
1891.6	176.6	0.72	Sellors	1

A fine pair deserving more attention than the published measures show, but it is doubtful if the companion could be seen by any other telescope in the Southern Hemisphere in the time covered by the above measures.

The p.m. of the chief star is 0″.023 towards 226°.3, and its mag. in C. P. D. = 5.9.

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No. 16. λ 268. C. Z. 16 h. 455. MAG. 7.5
16h 8m 0s — 38° 52′.6.

8.2 and 8.3

1897.4	164°.5	2″.17	See	2 n

No. 17. Harvard. θ Normae. 5.3
16h 8m 0s — 47° 7′.0.

1891	Double < 30″	13-inch.	Arequipa
1897	Single	7-inch.	Innes

No. 18. Harvard. Lac. 6735. 5.4
16h 8m 53s — 53° 33′.6.

1891	Double < 30″	13-inch.	Arequipa
1897	Two stars, 11 and 12 mag., 40″ ± to the N.		Innes

C. P. D. mag. = 7.5.

No. 19. λ 269. Lac. 6738. 6.8
16h 9m 36s — 52° 50′.1.

A = 7.6 B = 7.6 C = 13.0

A and B

1897.2	213°.4	0″.20 ±	See	1 n

A and C

1897.2	5°.0	21″.1	See	1 n

No. 20. Russell 275. Bris. 5644. 8.4
16h 9m 59s — 64° 19′.4.

8.8 and 9.5

1874.5	350°.0	4″.53	Russell	1 n
1881.5	352.6	3.83	,,	1
1887.5	350.5	3.94	Pollock	3–2

Separately observed on the meridian at Cordoba.

There is another double star about 5′ S.f. See next star.

No. 21. Innes 15. Lac. 6731. 7.0
16h 10m 42s — 64° 24′.1.

7.2 and 9.2

1895.6	314°.5	1″.20	Sellors	3 n

Russell 275 is 5′ N.pr.

No. 22. h. 4836. Lac. 6765. MAG. 7.5
16h 10m 56s — 34° 34′.4.

8.2 and 8.4

1836.8	292°.8	5″.14	*h*	2 n
1880.6	298.4	4.46	Hargrave	2
1890.5	298.5	5.40	Glasenapp	2
1892.0	294.3	4.34	Hough	2
1897.4	297.1	5.02	See	1

Also registered as *h* 4840 and Hough 401.

Both stars have been observed on the meridian at the Cape.

No. 23. λ 271. λ Normae. 5.6
16h 12m 20s 42° 25′.8.

6.0 and 6.8

1897.2	152°.0	0″.35	See	2 n

No. 24. h. 4841. γ_2 Normae. 4.2
16h 12m 21s — 49° 54′.6.

C. P. D. – 49°, 9162 = 9.4

1834.5	350°.9	25″. ±	*h*	1 n
1881.7	359.9	20. ±	Hargrave	1

The p.m. of the chief star is 0″.202 towards 252°.1.

In the C. P. D. the mag. of the chief star is 6.7.

No. 25. λ 272. Lac. 6781. 6.7
16h 12m 45s — 35° 14′.8.

Both = 7.5

1897.5	280°.2	0″.30	See	3–2 n

No. 26. λ... Lac. 6784. 7.3
16h 13m 26s — 39° 15′.4.

8.0 and 8.2

1897.1	179°.3	1″.67	See	– n

Lac. 6785, mag. 7.5, is 8′ S. and is also double. See next star.

No. 27. λ 273. Lac. 6785. 7.5
16h 13m 28s — 39° 23′.3.

Both = 8.3

1897.4	175°.5 ±	0″.35 ±	See	1 n

See also No. 26.

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No. 28. Innes 91. Piazzi 16 h. 37. MAG. 6.3
16h 13m 47s — 39° 11′.2.

Comes = 10.6

1896.7	290.° ±	6.″ ±	Innes	1 n
1896.9	295.9	10.8	See	3–2

This star was also noted as double at Arequipa in 1891.

See *Harvard Circular*, No. 18.

No. 29. h. 4843. Lac. 6796. 7.3
16h 15m 0s — 33° 3′.0.

Comes = 10.0

1837.5	270.°6	15.″ ±	*h*	1 n
1897.5	267.2	12.23	See	1

Also registered as Innes 92.

Another companion 45″ ± S.f.

Lac. 6797, mag. 7.3, is about 6′ N.f.

No. 30. ℍ. IV. 121. σ Scorpii. 3.0
16h 15m 6s — 25° 21′.2.

Comes = 7.6

1834.5	273.°8	15.″ ±	*h*	2 n
1847.6	271.1	22.34	Mitchel	1
1879.3	272.3	20.42	Cinc.	2
1882.4	271.2	20.42	,,	1
1896.5	272.1	20.61	Hussey	2

The p.m. of the chief star is o″.044 towards 235°.7.

No. 31. β 624. Lal. 29,770. 7.3
16h 16m 52s — 22° 52′.9.

7.5 and 9.2

1878.5	321.°7	1.″12	β	2 n
1879.4	320.0	1.25	Cinc.	3
1891.5	322.2	1.17	β	6
1895.6	316.1	1.15	Lick	3

Near ρ Ophiuchi, mag. 4.8.

No. 32. h. 4845. Lac. 6804. 7.5
16h 16m 53s — 41° 0′.7.

8.1 and 8.5

1836.4	135.°0	1.″20	*h*	2 n
1878.7	137.6	1.52	Melbourne	1
1891.6	136.1	2.13	Sellors	1

Lac. 6802, mag. 7.3, is about 12′ N.pr.

No. 33. h. 4848. Lac. 6815. MAG. 6.5
16h 17m 30s — 32° 57′.9.

7.1 and 7.4

1836.5	155.°0	6.″04	*h*	1 n
1846.2	155.0	6.14	Jacob	2
1877.5	153.4	5.92	Cinc.	1
1890.4	155.8	6.12	Glasenapp	2
1893.4	153.0	5.85	Scott	2

There is a 9.0 mag. star 92″ N.

No. 34. Cordoba [45]. C. Z. 16 h. 1114. 7.7
16h 17m 52s — 48° 54′.8.

A = 8.6 B = 8.6 C = 10.8

A and B

1895.6	206.°9	1.″64	Sellors	3 n

A and C

1895.6	108.°3	9.″91	Sellors	3

No. 35. ℍ. N. 39. Piazzi 16 h. 60. 5.4
16h 18m 22s — 29° 28′.2.

6.0 and 6.4

1834.4	356.°5	4.″ ±	*h*	1 n
1835.9	348.3	7.54	,,	3
1851.5	347.9	7.09	Jacob	2
1867.4	351.9	7.04	Harvard	1
1882.4	352.1	6.88	Cinc.	1
1890.4	350.4	6.35	,,	2
1893.4	351.3	6.24	Scott	2
1897.5	349.6	6.60	See	1

Common p.m. of o″.128 towards 150°.

C. P. D. combined mag. = 6.9.

Other measures.

Also registered as *h* 4850.

Looked for at S. Dec. 57° 29′ at Sydney in 1880, and not found.

No. 36. Dunlop 201. ι Triang. Austr. 5.3
Yellow
16h 18m 40s — 63° 49′.8.

Comes = 8.9 blue

1836.9	27.°2	24.″7	*h*	2 n
1871.6	21.7	22.1	Russell	2
1880.4	19.7	21.7	,,	1
1886.6	20.5	21.6	Pollock	1

Mr Russell's first measures are set against *h* 4847, his second against Russell 278.

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No. 37. β 1115. Piazzi 16 h. 68. MAG. 7.0
16h 19m 24s — 23° 13′.8.

7.4 and 8.5

1889.4	26°.3	0″.90	β	4 n
1897.4	18.4	0.72	Aitken	3
1897.6	26.7	0.97	See	1

Closely S.pr. ρ Ophiuchi, mag. 4.8.

No. 38. Innes 93. Lac. 6822. 7.7
16h 19m 28s — 47° 49′.0.

7.8 and 10.1

1896.7	300°. ±	0″.8 ±	Innes	2 n
1897.2	284.1	1.13	See	1

Very difficult, Prof. See calls the companion 12.1 mag.

About 40′ S. pr. beautifully-coloured pair ε Normae.

No. 39. Innes 94. Lac. 6837. 7.7
16h 19m 31s — 29° 41′.5.

7.9 and 9.5

1896.6	195°. ±	1″. ±	Innes	1 n
1897.6	202.5	0.42	See	2

Also recorded as λ 277.

h 4850, mag. 5.7 (C. P. D. = 6.9), a wide pair is 69s pr. and 13′ N.

No. 40. H. 11. 19. ρ Ophiuchi. 4.8
16h 19m 35s — 23° 13′.0.

5.2 and 6.2, both yellowish

1835.4	362°.1	4″. ±	*h*	1–2 n
1857.5	363.2	3.19	Secchi	1
1877.5	357.3	3.30	Schiaparelli	4–3
1882.5	357.0	3.66	Cinc.	3
1889.4	355.0	3.41	β	3
1890.4	355.6	3.35	Glasenapp	2
1897.4	352.8	3.39	Scott	2
1898.5	354.2	3.33	Solá	1

Other measures.

Small common p.m.

Slow decrease in angle.

β 1115 is in the field.

No. 41. Howe 42. Lac. 6835. MAG. 8.2
16h 19m 37s — 34° 45′.1.

8.7 and 9.3

1876.5	110°. ±	1″.2 ±	Howe	1 n
1892.0	103.7	1.09	Hough	2
1897.5	106.7	1.85	Lowell	2

Also registered as Hough 404.

An 8.6 mag. star is 5s f. 2′ N.

No. 42. λ 278. C. Z. 16 h. 1282. 8.5
16h 19m 40s — 31° 0′.2.

Both = 9.3

1897.5	317°.5	0″.63	Cogshall	1 n

Found by Mr Cogshall.

No. 43. Hough 403. B. D.—12°, 4501. 8.8
16h 19m 45s — 12° 56′.9.

Comes = 13.9

1893.0	166°.4	3″.50	Hough	2 n

No. 44. β 950. W. B. 16 h. 324. 8.2
16h 19m 47s — 9° 38′.1.

8.6 and 9.5

1880.5	355°.1	1″.18	β	5 n
1888.5	350.9	1.2 ±	Haverford	1
1892.4	354.5	1.07	β	3

The p.m. is very small.

No. 45. h. 4853. ε Normae. 4.7
16h 19m 51s — 47° 19′.6.

4.9 green and 6.9 purple

1836.0	335°.3	23″.9	*h*	3 n
1846.0	335.0	22.9	Jacob	3
1871.5	335.6	23.1	Russell	1
1881.7	336.0	22.4	Hargrave	1
1897.2	335.3	22.8	See	2

The colours of this pair are very fine.

At the Sydney Observatory in 1881 the mags. were recorded as 8th and 10th respectively; Prof. See also records the companion as 10.3 mag.

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No. 46. h. 4854. Lac. 6827. MAG. **6.6 Orange**

16h 21m 25s — 57° 32′.0.

1836.±	N.f. < 2″	*h*	1 n
1871.5	Not divided	Russell	1
1872.4	46°.4 1″.75	,,	1
1874.5	Not divided	,,	1
1880.5	Single	,,	2

h:—"Very difficult," 1836.

Russell:—"Very easy," 1872.

The p.m. is 0″.15 towards 180°.

The mag. of the companion is not given by either observer.

No. 47. Burg. Antares. 1.1 Red

16h 23m 16s — 26° 12′.6.

Comes = 7.0 green

1847.3	273°.7	3″.47	Dawes	11–9 n
1852.6	272.8	2.94	Jacob	3
1856.7	274.3	3.30	,,	6–5
1877.6	271.5	3.25	Hall	4
1880.0	271.7	2.92	*β*	2
1886.6	270.3	2.88	Hall	3
1894.6	273.0	2.76	Sellors	3–2
1896.5	274.6	3.16	Hussey	5
1896.6	272.3	3.18	See	3

Many other somewhat discordant measures.

Common p.m. of 0″.041 towards 223°.4.

Combined mag. in C. P. D. = 4.2, owing to the red colour of the chief star.

Found many years ago during an occultation.

A good test requiring a fine atmosphere, and best seen in daylight.

No. 48. Σ 2048. Piazzi 16 h. 88. 7.2

16h 23m 25s — 7° 54′.3.

7.3 and 9.7

1831.5	302°.7	4″.69	Σ	3 n
1848.2	301.0	4.69	Mitchel	2
1878.5	301.3	5.04	*β*	1
1879.4	300.6	5.02	Cinc.	2
1890.4	301.9	4.46	Glasenapp	2

Not much evidence of change.

Common p.m. of 0″.114 towards 195°.1.

No. 49. h. 4857. C. Z. 16 h. 1503. MAG. **7.7**

16h 23m 46s — 46° 15′.6.

8.0 white, and 9.3 reddish

1834.5	73°.5	5″.±	*h*	1 n
1872.6	72.7	7.44	Russell	1
1880.6	73.4	5.19	Hargrave	1

No. 50. Russell 281. C. Z. 16 h. 1637. 8.5

16h 26m 15s — 61° 41′.1.

8.9 and 9.9

1880.4	123°.4	3″.76	Russell	1 n

No. 51. Σ 3105. Lal. 30,053. 7.9

16h 26m 26s — 6° 48′.4.

8.6 and 8.7

1830.9	59°.4	0″.4 ±	Σ	2 n
1835.6	57.5	0.62	,,	1
1870.0	53.2	0.5 ±	Dembowski	7
1878.5	50.9	0.61	*β*	1
1880.4	42.7	0.7 ±	Cinc.	1
1886.2	41.5	0.51	L. McC.	1
1888.5	40.5	0.45	Hall	3
1895.6	34.9	0.39	Comstock	3–2

Some very discordant measures have been omitted.

Distance decreasing, and the angular motion increasing.

No. 52. Innes 95. Lac. 6871. 7.3

16h 26 32s — 33° 19′.1.

7.4 and 9.8

1896.6	350°.±	1″.5 ±	Innes	2 n
1897.6	359.0	1.58	See	3

C. Z. 16 h. 1635, mag. 8.0, is 52 secs. pr. 4′ N.

No. 53. h. 4858. *β* Apodis. 4.2

16h 28m 47s — 77° 18′.5.

Comes = 12.0

1835.4	104°.4	20″.±	*h*	1 n
1871.5	No companion found.		Russell	1
1895.4	Well seen.		Innes	2

The p.m. of *β* Apodis is 0″.467 towards 223°.3.

C. P. D. mag. = 6.4.

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No. 54. h. 4863. C. Z. 16 h. 1894. MAG. 8.2
16h 29m 24s — 53° 34′.3.

8.7 and 9.4

1834.5	123°.1	4″. ±	*h*	1 n
1880.7	121.1	3.48	Hargrave	1

Separately observed on the meridian at Cordoba.

No. 55. h. 4866. Lac. 6887. 7.3
16h 31m 26s — 56° 47′.6.

7.9 and 8.3 yellowish

1836.0	127°.1	3″. ±	*h*	4 n
1875.6	124.4	3.43	Sydney	2
1890.0	123.7	3.66	Sellors	2

Separately observed on the meridian at Cordoba.
C. Z. 16 h. 2038, mag. 9.0, is 3′.5 N.

No. 56. β 819. B.D.—4°,4133. 9.0
16h 31m 30s — 4° 57′.6.

9.1 and 11.8

1881.4	230°.8	1″.59	β	3 n
1888.6	231.3	1.59	Washburn	3

No. 57. Sellors 12. Lac. 6902. 7.3
16h 32m 33s — 47° 35′.0.

7.9 and 8.2

1893.6	178°.1	1″.00	Sellors	2 n
1895.6	181.4	1.31	,,	3

At one time wrongly identified as C. Z. 16 h. 2139.
See also the two double stars, Nos. 59 and 60, which must not be confused with this pair.

No. 58. λ 282. C. Z. 16 h. 2186. 8.5
16h 32m 59s — 34° 0′.4.

Comes = 12.8

1897.7	205°.0	2″.49	See	1 n

The f. of a small group.

No. 59. Cordoba [46]. C. Z. 16 h. 2202. MAG. 8.0
16h 33m 19s — 47° 28′.3.

8.4 and 9.3

1889.5	101°.4	2″.61	Pollock	2 n
1895.6	99.8	2.61	Sellors	3

No. 60. Sellors 21. Lac. (6915). 7.8
16h 33m 41s — 47° 33′.0.

8.0 and 9.7

1895.6	321°.9	1″.51	Sellors	3 n

See also two preceding pairs, Nos. 57 and 59.

No. 61. Multiple. Lac. 6912. 5.6
16h 33m 51s — 48° 34′.0.

A = 6.1 B = 9.5 C = 12.0 D = 7.1

A and B = Melbourne [8]

1878.8	12°.0	2″.05	Melbourne	1 n
1897.2	11.6	1.73	Lowell	3

A and C = Innes 96

1896.6	180°. ±	9″. ±	Innes	1 n

A and D = *h* 4876

1837.0	265°.1	9″.83	*h*	2 n
1846.3	265.8	9.91	Jacob	1
1876.5	265.6	9.76	Cape M. O.	3
1897.2	266.1	9.53	Lowell	3

h measures two more distant stars, one of which (164°.9, 12″) may be Innes 96.
Very beautiful, followed by a group of stars, one of which is double.
Also noted as T (triple?) at Arequipa in 1891.
See *Harvard Circular*, No. 18.
C. P. D. mag. = 6.8.

No. 62. Innes 97. C. Z. 16 h. 2233. 8.5
16h 33m 56s — 48° 33′.5.

8.6 and 11.3

1896.6	N.f.	2″. ±	Innes	1 n

Closely N.f. the quadruple star Lac. 6912.

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No. 63. h. 4874. Bris. 5784. MAG. 7.5
16h 34m 5s — 60° 43′.9.

8.2 and 8.3 yellow

1834.6	300°.2	2″.±	*h*	1 n
1871.6	304.1*	3.80	Russell	1
1880.6	297.1	2.82	Hargrave	1
1891.5	295.0	3.80	Sellors	1

Mr Russell's measure is from Russell 282 in his list of new double stars.

The mag. of the chief star has been estimated as follows:—

h:— 9.5
Russell:— 6.5
Stone:— 8.1
C.G.A.:— 8.2
Hargrave:—10.0
Sellors:— 8.0

No. 64. β 820. Lal. 30,279. 7.3
16h 34m 11s — 2° 54′.5.

Comes = 10.0

1892.4	237°.4	4″.28	β	3 n

The p.m. of the chief star is 0″.112 towards 290°.9.

No. 65. Innes 39. Lac. 6931. 8.0
16h 35m 16s — 32° 37′.6.

Comes = 10.9

1895.8	pr.	3″.±	Innes	1 n

C. P. D. mag. = 7.5.

The pr. and brightest star of a group in the finder.

No. 66. Russell 283. Lac. 6933. 6.9
16h 35m 48s — 36° 52′.9.

7.3 and 8.3, both yellow

1881.6	87°.8	0″.42	Russell	1 n
1896.6	94.4	0.90	See	3
1897.5	86.6	1.06	Lowell	4

The dec. of this fine pair is upwards of 1° wrong in the original catalogue, and no reference to a star catalogue was given. It was refound independently, and registered as Innes 98; and a later search revealed no similar pair nearer the Sydney position.

Also recorded as λ 284.

No. 67. Harvard. Lac. 6906. MAG. 5.3
16h 36m 37s — 66° 55′.3.

1891.0	Double within 30″	Arequipa	– n
1897.0	Single	Innes	1

From *Harvard Circular*, No. 18.

No. 68. Harvard. Lac. 6927. 6.6
16h 36m 45s — 52° 57′.8.

Double, Arequipa 1891.

From *Harvard Circular*, No. 18.

No. 69. Harvard. Lac. 6946. 6.4
16h 37m 2s — 37° 57′.9.

1891.0	Double within 30″	Arequipa	– n

From *Harvard Circular*, No. 18.

No. 70. β 1116. Lac. 6958. 6.8
16h 38m 5s — 27° 16′.1.

6.9 and 9.5

1889.4	359°.4	1″.78	β	3 n
1897.5	356.7	2.21	See	1
1897.5	355.3	1.85	Aitken	3

Prof. See also measured a faint star 25″ S.

A 9.5 mag. star is closely N.f.

No. 71. h. 4885. Cape 1880, 9095. 7.8
16h 40m 7s — 48° 10′.0.

8.2 and 9.1

1834.6	247°.0	4″.±	*h*	1 n
1880.6	244.4	3.68	Hargrave	1
1897.2	242.7	4.24	See	3

Lac. 6960, mag. 7.7, is 45″ N.f.; and Lac. 6959, mag. 7.0, is a little way N.pr.

No. 72. Innes 99. C. Z. 16 h. 2834. 7.5
16h 42m 22s — 43° 46′.0.

7.9 and 8.9

1896.5	N.f.	1″.±	Innes	2 n

C. Z. 16 h. 2711, mag. 8.3, is 1m 43s pr.

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No. 73. Cordoba [47]. Lac. 6982. MAG. 6.4
16h 42m 58s — 49° 52′.2.

7.1 and 7.2

1889.6	44°.2	2″.87	Pollock	2 n
1894.6	43.9	2.62	Sellors	1

No. 74. λ 289. Yarnall$_3$ 7069. 8.0
16h 44m 14s — 31° 27′.8.

Comes = 15.0

1897.5	99°.5	3″.43	See	1 n

No. 75. h. 4889. Lac. 6999. 6.7
16h 44m 15s — 37° 20′.5.

6.8 and 9.4

1835.4	5°.0	7″.24	*h*	3 n
1847.4	6.3	6.82	Jacob	–
1877.5	5.4	6.44	Cinc.	1
1878.8	5.6	6.94	Melbourne	1
1880.6	7.7	6.49	Hargrave	1
1890.5	3.6	6.91	Glasenapp	2–1
1897.5	6.1	6.88	See	2

Separately observed on the meridian at Cordoba in 1878, but the *comes* was made S.pr.

No. 76. λ 291. Lac. 7022. 7.0
16h 46m 8s — 25° 25′.9.

Comes = 13.9

1897.7	6°.9	2″.64	See	1 n

No. 77. λ 292. ζ_1 Scorpii. 5.0
16h 46m 56s — 42° 11′.7.

5.5 and 6.0

1897.1	175°.0	0″.20	See	1 n

The p.m. is very small.

No. 78. λ 293. Piazzi 16 h. 200. 6.6
16h 47m 1s — 41° 38′.4.

Both = 7.4

1897.5	270°. ±	0″.2 ±	See	1 n

Prof. See also measures two distant faint stars.
See also the next star, which is about 57″ N.f.

No. 79. Triple. Piazzi 16 h. 201. MAG. 7.7
16h 47m 3s — 41° 37′.5.

A = 7.9 B = 14.7 C = 10.1

A and B = λ 294

1897.5	51°.1	6″.41	See	1 n

A and C = *h* 4892

1834.6	299°.1	5″. ±	*h*	1 n
1847.3	301.5	8.31	Jacob	1
1881.7	299.4	8.34	Hargrave	1
1897.4	301.0	9.05	See	2

A cluster is S.f., several wide pairs in which have been measured by Prof. See.

No. 80. Innes 100. Lac. 6969. 6.8
16h 47m 39s — 73° 15′.8.

7.0 and 8.5

1896.5	S.f.	0″.8 ±	Innes	1 n

No. 81. Innes 101. C. Z. 16 h. 3270. 9.0
16h 47m 55s — 40° 54′.1.

9.4 and 10.4

1896.7	355°. ±	1″. ±	Innes	1 n

Lac. 7029, mag. 6.1, is S.f.; and C. Z. 16 h. 3280, mag. 8.9, is more closely N.f.

No. 82. β 123. Ö.A. 16,094. 8.0
16h 48m 41s — 21° 52′.7.

8.5 and 8.9

1877.4	204°.6	1″.65	Cinc.	2 n
1886.4	205.1*	1.56	„	1
1892.5	203.9	1.57	Haverford	3
1898.3	201.6	1.67	See	1

A 7.3 mag. star is 10′.6 N.

No. 83. h. 4896. C. Z. 16 h. 3337. 8.0
16h 48m 50s — 46° 41′.2.

8.2 and 9.8

1836.3	28°.0	4″.39	*h*	3 n
1871.5	23.7	4.50	Russell	1
1897.2	23.0	4.01	See	1

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No. 84. Hough 408. Cor. D. M. —23°, 12,973. MAG. 9.5
16h 49m 20s — 24° 0′.6.

10.2 and 10.4

1893.5	247°.4	2″.14	Hough	2 n

No. 85. β 241. Lal. 30,725. 6.5
16h 49m 35s — 21° 24′.5.

7.2 and 7.3

1874.5	[314°.2*]	0″.5 ±	β	4 n
1877.4	341.8	0.55	Cinc.	2–1
1878.6	345.1	0.6 ±	Schiaparelli	2
1879.1	339.6*	0.63	Cinc.	5
1881.6	343.0	0.65	β	3
1888.6	344.2	0.6 ±	Haverford	2
1890.5	340.0*	0.75	β	3
1895.6	342.1*	0.71	Lick	3
1898.5	343.2	0.71	See	1

No certain change.

No. 86. λ 311. Lac. (7058). 7.3
16h 49m 52s — 31° 8′.7.

Comes = 14.9

1897.5	128°.9	3″.25	See	1 n

No. 87. λ 313. Yarnall$_3$ 7133. 7.7
16h 50m 11s — 38° 16′.4.

7.9 and 9.7

1897.6	232°.8	2″.50	See	1 n

No. 88. Σ 3106. W.B. 16 h. 912. 8.5
16h 50m 20s — 5° 0′.4.

Both = 9.3

1831.9	246°.5	2″.35	Σ	4 n
1867.2	246.3	2.19	Dembowski	3
1878.5	246.8	2.19	β	2–1
1886.4	245.7*	2.29	L. McC.	1
1890.5	248.0	2.54	Glasenapp	2–1

Fixed, with a common p.m. of o″.246 towards 284°.1.

Other measures.

No. 89. h. 4899. C. Z. 16 h. 3469. MAG. 8.5
16h 50m 35s — 45° 46′.8.

9.2 and 9.3

1834.5	271°.2	1″. ±	*h*	1 n
1880.6	275.4	3.19	Hargrave	1
1897.2	275.8	2.48	Lowell	2

h :—"The chief of a cluster."

No. 90. β 1117. 24 Ophiuchi. 5.6
16h 50m 46s — 22° 59′.5.

6.3 and 6.5

1889.4	264°.2	0″.70	β	4 n
1890.4	264.3	0.58	„	3
1893.5	270.6	0.56	Goodsell	2
1897.5	267.2	0.62	Aitken	3
1898.3	266.0	0.66	See	1

Common p.m. of o″.028 toward 265°.8.

No. 91. Piazzi. Mayer 682. 6.9
16h 51m 11s — 19° 22′.9.

7.3 and 8.4

1836.5	229°.6	5″. ±	*h*	1 n
1879.0	230.9	4.84	Cinc.	4
1890.4	231.7	4.57	Glasenapp	2

Fixed.

Also registered as South and *h* 240.

No. 92. Harvard. Lac. 7052. 6.5
16h 51m 59s — 54° 26′.5.

Noted as Double at Arequipa. See *Harvard Circular*, No. 18.

No. 93. λ 315. Piazzi 16 h. 237. 6.6
16h 52m 6s — 37° 27′.9.

Both = 7.4

1897.5	203°.4	0″.31	See	1 n

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No. 94. h. 4901. Bris. 5907. MAG. 8.2
16h 52m 27s — 58° 41′.9.

Both = 9.0 white

1836.5	132.7	2.5 ±	*h*	2 n
1872.5	131.6	3.17	Russell	2
1878.8	132.7	3.10	Melbourne	1
1888.6	129.8	2.89	Tebbutt	1
1890.6	130.1	2.73	Sellors	1

This is also registered as Russell 287.
Combined mag. in C. P. D. = 7.0; in C. Z. = 6.8.

No. 95. Washburn 131. Lac. 7057. 6.9
16h 52m 46s — 56° 24′.2.

Comes = 10.5

1891.6	133.6	3. ±	Sellors	1 n
1895.6	134.9	2.10	,,	2

Noted as double at Arequipa in 1891. See *Harvard Circular*, No. 18.
C. Z. 16 h. 3545, mag. 8.0, is S.pr., and a 9.0 mag. star is more closely N. pr.

No. 96. λ 316. Lac. 7064. 6.4
16h 52m 54s — 48° 29′.6.

6.9 and 7.6

1897.2	178.9	0.59	See	2 n

In C. P. D. combined mag. = 7.6.

No. 97. Hargrave [288]. C. Z. 16 h. 3778. 8.5
16h 54m 47s — 48° 46′.2.

9.1 and 9.5

1881.7	55.6	1.99	Hargrave	1 n
1887.6	50.2	2.84	Pollock	3–2
1894.6	52.2*	2.23	Sellors	1

This is the principal star of *h* 4906, which, curiously enough, Mr Hargrave could not find on the same night that the close pair was discovered.
The *comes* noted by *h* is 11th mag., distance 15″.

No. 98. λ . . . Cor. D.M.—39°, 11,005. 10.0
16h 54m 51s — 39° 30′.6.

10.4 and 11.4

1897.1	126.9	1.62	See	– n

h 4908, a similar but larger pair, is S.f.

No. 99. Harvard. ϵ_2 Arae. MAG. 5.4
16h 55m 9s — 53° 5′.2.

Noted as double < 30″ at Arequipa.
See *Harvard Circular*, No. 18.
C. P. D. mag. = 6.7.

No. 100. Cordoba [48]. Lac. 7075. 7.0
16h 55m 11s — 50° 0′.8.

7.5 and 8.2

1873.3	230.0	9.96	C. G. A.	3 n
1888.6	234.1	8.02	Pollock	5–4
1894.6	232.3	7.51	Sellors	1

No. 101. Cordoba [49]. C. Z. 16 h. 3841. 7.6
16h 55m 33s — 46° 36′.3.

8.0 and 9.0

1897.2	41.0	3.17	Cogshall	1 n

No. 102. λ . . . C. Z. 16 h. 3847. 8.0
16h 55m 38s — 46° 2′.3.

8.2 and 10.2

1897.2	226.6	1.71	Cogshall	1 n

In Prof. See's list this star is called "Cordoba duplex," but the reference has not been found.

No. 103. h. 4909. Lac. 7083. 8.1
16h 56m 13s — 50° 56′.3.

8.4 and 9.6

1877.7	158.8	10.7	C. G. A.	4 n
1880.5	158.0	5. ±	Russell	1

No. 289 of Mr Russell's list of new double stars.
The nearest of several stars. The star, Cape 1840, No. 2255, mag. 8.2, is 17″ away, and was the only one measured by *h*, who, however, noted the others. See page 272 of his *Results of Astronomical Observations*.

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No. 104. h. 4904. Lac. 7028. MAG. **7.4**
16h 56m 55s — 75° 14′.5.

7.7 and 9.0

1835.4	184.°2	3.″ ±	*h*	1 n
1872.5	183.5	7.11	Russell	1

No. 105. h. 4913. C. Z. 16 h. 3975. 8.0
16h 57m 37s — 47° 5′.8.

8.5 and 9.2

1834.5	243.°6	3.″ ±	*h*	1 n
1889.4	236.6	3.31	Pollock	2

Separately observed on the meridian at Cordoba in 1880.

No. 106. Harvard. *k* Scorpii. 5.0
16h 58m 15s — 33° 58′.9.

Noted as double at Arequipa, *comes* within 30″.
See *Harvard Circular*, No. 18.
C. P. D. mag. = 6.2.

No. 107. λ 318. C. Z. 16 h. 4113. MAG. **8.0**
16h 59m 21s — 38° 29′.5.

8.5 and 9.0

1897.6	235.°3	0.″29	See	1 n

No. 108. Harvard. Lac. 7123. 6.5
16h 59m 35s — 37° 5′.4.

A = 6.5 B = 11.5 C = 11.5

A and B

1897.4	84.°8	7.″13	See	1 n

A and C

1897.8	N.f.	40.″ ±	Innes	1 n

Noted as triple within 30″ at Arequipa in 1891.
From *Harvard Circular*, No. 18.
It is at present unknown whether the stars above noted are those referred to in the *Harvard Circular*.

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No. 1. Cordoba [73]. Lac. 7120. MAG. 7.3
17h 0m 7s — 44° 18′.4.

7.4 and 9.9

1897.6	139°.4	5″.07	See	1 n

Also registered in error as Innes 102.

No. 2. Σ 2119. Lal. 31,068. 7.3
17h 0m 50s — 13° 47′.9.

8.0 and 8.1

1831.8	17°.8	1″.95	Σ	3 n
1848.6	15.2	2.30	Mitchel	1
1858.1	13.7	1.6 ±	Dembowski	2
1868.5	15.0	1.73	Harvard	1
1879.8	14.8	2.00	Cinc.	3
1884.5	14.4	1.95	,,	1
1890.4	12.9	2.61	Glasenapp	2
1896.6	14.0	2.25	Hussey	2

The angle is slowly decreasing.

No. 3. h. 4914. C. Z. 16 h. 4161. 8.7
17h 1m 13s — 72° 34′.7.

9.4 and 9.5

1835.5	82°.4*	1″.5 ±	*h*	2 n
1875.5	76.8	3.04	Sydney	2

No. 4. Dunlop 213. Lac. 7141. 6.5
17h 2m 56s — 46° 36′.6.

6.9 and 7.9

1836.5	166°.1	8″.65	*h*	2 n
1871.5	165.2	8.10	Russell	1
1876.6	167.9	7.42	Cape M.O.	1
1879.7	165.5	7.30	Hargrave	1
1897.2	166.8	7.97	See	1

Distance decreasing?

Erroneously called *h* 4919 by both Mr Russell and Mr Hargrave.

No. 5. Dunlop 214. Lac. 7107. MAG. 6.5 Yellow
17h 3m 5s — 67° 4′.1.

Comes = 9.4 blue

1835.5	330°.4	28″.6	*h*	1 n
1871.6	340.9	27.9	Russell	1
1880.5	344.3	27.1	C. G. A.	1

The p.m. of the chief star is about 0″.1, viz., R. A. = −0ˢ.02. Dec. = +0″.075, which about accounts for the change shown.

6. h. 4923. Lal. 31,140. 8.2
17h 3m 17s — 18° 7′.6.

8.6 and 9.6

1835.0	184°. ±	3″. ±	*h*	1 n
1879.4	168.2	7.31	Cinc.	3
1898.5	163.3	8.91	See	1

The change shown is probably due to p.m.

No. 7. Innes 246. Lal. 31,152. 7.5
17h 3m 53s — 27° 38′.8.

7.6 and 10.0

1897.8	30°. ±	0″.9 ±	Innes	1 n

A more distant star = 10.5 mag. in the same direction.

No. 8. h. 4920. Lac. 7136. 6.9
17h 4m 20s — 58° 28′.2.

7.1 and 8.9

1836.5	331°.4	3″.5 ±	*h*	1 n
1872.5	329.9	3.08	Russell	2
1886.6	328.3	2.64	Pollock	1

The components have been separately observed on the meridian at Cordoba.

Some change shown.

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No. 9. β 1118. η Ophiuchi. MAG. 2.6
17h 4m 38s — 15° 36′.1.

3.1 and 3.6

1889.4	274.°7	0.″35	β	4 n
1890.4	271.1	0.38	,,	4
1892.4	270.0	0.36	,,	3
1896.5	259.8	0.38	Leavenworth	3
1897.5	260.7*	0.53	See	1
1897.5	259.1	0.40	Aitken	4

Common p.m. of 0″.097 towards 2°.6.

On account of the closeness and brightness of this pair, it is one of the most remarkable double stars known.

See :—

1889. Burnham, S. W., "Discovery," *Astr. Nach.*, No. 2912.

No. 10. β 124. Lal. 31,224. 8.0
17h 5m 1s — 0° 38′.0.

8.0 and 11.2

1875.1	253.°5	1.″12	Dembowski	3 n
1879.4	263.2	1.13	Cinc.	2–1
1881.4	266.3	0.94	β	2
1891.7	266.8	0.94	,,	2

No. 11. λ 320. Lac. 7159. 5.7
17h 5m 22s — 39° 22′.9.

6.2 and 6.8

1897.7	294.°0	0.″62	See	2 n

The p.m. is very small.

See also No. 16.

No. 12. β 956. Piazzi 16 h. 308. 8.0
17h 5m 24s — 26° 34′.7.

8.2 and 9.9

1880.5	163.°1	0.″63	β	2 n
1897.7	163.3	0.58	See	1

Suspected in 1873 by β with a 6-inch refractor.

Almost directly preceding A Ophiuchi, 4.7 mag., and about 22′ N.pr. the double star β 125.

No other measures found.

No. 13. β 125. Piazzi 16 h. 311. MAG. 7.0
17h 5m 58s — 26° 55′.0.

7.2 and 9.5

1877.4	62.°8	1.″72	Cinc.	2 n
1880.5	68.3	1.56	β	2
1889.5	61.3	1.48	,,	3
1897.7	67.1	1.65	See	2

β 956 is 22′ N.pr.

No. 14. Howe 46. Lac. 7168. 7.0
17h 7m 3s — 38° 10′.5.

7.1 and 9.6

1880.8	138.°8	2.″34	Russell	1 n
1890.6	145.0	3.10	Sellors	1
1893.5	148.9	3.14	Hough	1
1897.2	144.0	2.86	See	3

Found by Prof. Howe in 1876. Seen at Cordoba in 1874, at the Cape in 1877; registered as a new pair, Russell 296, in 1880, and again in 1893 by Prof. Hough.

No. 15. Σ 2132. Lal. 31,290. 8.2
17h 7m 28s — 3° 56′.0.

8.6 and 9.4

1831.5	108.°0	1.″52	Σ	3 n
1848.6	107.1	1.53	Mitchel	1
1857.0	111.9	1.39	Secchi	2
1880.1	110.8	1.63	Cinc.	3
1890.5	113.3	1.95	Glasenapp	2

No. 16. Triple. Lac. 7171. 7.0 Orange
17h 7m 32s — 39° 38′.9.

A = 7.6 B = 7.9 C = 10.0

A and B = λ 321

1896.7	102.°8	0.″61	See	2 n

A + B and C = *h* 4926.

1835.2	333.°5	11.″±	*h*	3 n
1896.7	331.8	15.65	See	1

h and See also measure a more distant star, 11.0 mag., S.pr.

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No. 17. β 1247. **Lal. 31,296.** MAG. 7.3
$17^h\ 8^m\ 9^s$ — 9° 9′.9.

7.4 and 9.7

1891.5	345°.5	1″.62	β	4 n
1897.6	339.6	1.39	Aitken	3

No. 18. Innes 229. C. Z. 17 h. 433. 8.5
$17^h\ 8^m\ 23^s$ — 39° 32′.0.

8.8 orange, and 10.0 blue

1898.5	235°.0	5″.04	See	1 n

Mag. in C. P. D. = 9.7.
Several distant *comites* make up a pretty field.

No. 19. Barnard. W.B. 17 h. 93. 7.8
$17^h\ 8^m\ 44^s$ — 8° 17′.3.

7.8 and 11.4

1891.5	154°.7	2″.16	β	3 n
1895.5	148.9	2.06	Lick	3

No. 20. Innes 104. Lac. 7146. 6.5
$17^h\ 9^m\ 7^s$ — 69° 55′.8.

6.6 and 9.5

1896.5	S.f.	2″.±	Innes	1 n

ι Apodis, mag. 5.6, is S.f.

No. 21. South and h. 243. A Ophiuchi. 4.7
$17^h\ 9^m\ 12^s$ — 26° 27′.4.

5.3 and 5.6 white

1823.7	227°.9	5″.35	South	2 n
1835.2	223.5	5.19	*h*	5–4
1841.6	219.3	4.78	Dawes	3–2
1847.6	216.1	4.27	Mitchel	1
1848.6	215.5	4.30	Harvard	1
1854.1	214.4*	4.13	Jacob	2
1856.9	213.2	4.45	Morton	5
1856.9	212.4	4.43	Secchi	3
1862.4	212.4	4.22	Dembowski	–
1871.5	204.1	4.16	Harvard	1
1876.6	203.3	4.16	Plummer	3
1880.5	200.6	4.21	Pritchett	3
1888.6	197.2	4.33	Hall	2
1896.6	194.6	4.09	Pritchett	3
1897.7	192.5*	4.21	See	1
1898.5	191.8	4.20	Solá	2

Other measures.
Large common p.m. of 1″.250 towards 204°.5, which is about the same in amount and direction as that of Bradley 2179, a star of the 6.8 mag., about 13′ N.f.; and it is not very different from that of Lal. 31,055, a 7.3 mag. star 22° N.pr.
Both components of A Ophiuchi have been thought variable.
Lal. 31,302, mag. 7.8, about 3′ distant, has been measured as follows:—

1879.3	305°.9	198″.0	β	1 n

No. 22. λ 322. **Piazzi 17 h. 10.** MAG. 6.9
$17^h\ 9^m\ 16^s$ — 33° 37′.3.

7.6 and 7.7

1897.4	1°.3	0″.20	See	1 n

No. 23. λ 323. **C. Z. 17 h. 500.** 8.0
$17^h\ 9^m\ 20^s$ — 38° 13′.4.

8.6 and 8.9

1897.5	184°.3	0″.20	See	1 n

No. 24. β 282. **U.A. 105 Ophiuchi.** 6.4
$17^h\ 9^m\ 39^s$ — 14° 28′.1.

Comes = 10.7

1875.4	154°.1	4″.23	Dembowski	3 n
1880.0	153.5	4.25	Cinc.	2–1
1881.4	151.7	4.41	β	4
1889.4	151.9	4.31	,,	3
1896.6	153.7	4.28	Hussey	2

At Cincinnati the chief star was suspected to be a close double, but β, with the 36-inch Lick telescope, found it single.

No. 25. Harvard. Lac. 7189. 6.2
$17^h\ 9^m\ 41^s$ — 35° 37′.5.

1891.0	Double	< 30″	Arequipa	– n

See *Harvard Circular*, No. 18.
Prof. See measures a star 36″.5 distant in 18°.5.

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No. 26. Cinc. Ö.A. 16,530. MAG. 8.8
17h 9m 53s — 18° 5′.0.

9.5 and 9.6

1884.5	293°.1	1″.31	Cinc.	1 n

The chief star of the wide pair *h* 4932, the *comes* of 10.5 mag. being S.pr. 10″.5.

No. 27. β 957. Lal. 31,341. 7.5
17h 10m 4s — 10° 11′.0.

8.2 and 8.3

1880.2	203°.6*	0″.58	β	3 n
1888.5	199.5*	0.5 ±	Haverford	1
1889.5	201.7	0.47	β	3

No. 28. β 958. Lal. 31,344. 7.9
17h 10m 35s — 19° 13′.5.

8.4 and 8.9

1880.5	221°.0	1″.38	β	2 n
1888.5	216.2	1.37	Haverford	1
1892.4	216.9	1.38	β	3
1897.7	212.6	1.61	See	1

No. 29. β 1119. Lac. 7212. 6.9
17h 10m 57s — 30° 3′.2.

7.4 and 8.0

1889.4	355°.8	0″.75	β	3 n
1897.6	357.5	0.54	Aitken	3
1897.7	353.7	0.56	See	1

C. P. D. mag. = 7.9.

Hough 413, a wide pair, 8.5 and 12.5 mags., is 5m 3s f. and 3′ S.

The p.m. is insensible.

No. 30. λ 324. Lac. 7207. 7.2
17h 11m 15s — 38° 3′.3.

Both = 8.0

1897.7	35°.2	0″.27	See	1 n

No. 31. Brisbane. Lac. 7194. MAG. 5.5
17h 11m 26s — 46° 32′.0.

5.6 yellow, and 8.4

1880.7	6°.1	2″.91	C. G. A.	1 n
1880.8	0.3	3.66	Russell	1
1896.7	45. ±	2. ±	Innes	1
1897.2	46.3	2.91	See	2
1898.7	55.5	...	Innes	1

Common p.m. of 0″.84 towards 79°.7.

First noted as double about 1825 in Brisbane's *Paramatta Catalogue*, after which it escaped observation for upwards of half a century.

Also registered as Russell 297, and at Arequipa in 1891 as a triple.

An interesting binary in quick motion.

In the *B. A. C.* this star is erroneously called Lac. 7195.

C. P. D. mag. = 7.3.

No. 32. ℍ. I. 35. 38 Ophiuchi. 7.4
17h 11m 27s — 26° 31′.1.

7.6 and 9.6 white.

1783.2	330°.8	″.....	ℍ	1 n
1876.5	333.4	6.12	Cinc.	2
1890.5	334.8	5.54	Glasenapp	2
1897.7	333.4	5.92	See	2

Other measures. No change.

No. 33. h. 4931. Bris. 6016. 7.5
17h 11m 48s — 59° 20′.1.

Both = 8.3

1836.5	261°.8	0″.9 ±	*h*	1 n
1871.6	[254.6]	[2.22]	Russell	1
1873.5	258.1	0.57	,,	2–1
1878.8	257.3	1.29	Melbourne	1
1879.6	257.5	1.00	Hargrave	1
1886.6	256.8	0.7 ±	Sydney	2

Angle decreasing?

No. 34. ℍ. III. 25. o Ophiuchi. 5.2
17h 11m 55s — 24° 10′.7.

5.5 yellow, and 6.9 blue

1837.5	358°.3	15″. ±	*h*	1 n
1857.0	355.2	10.8	Secchi	2
1877.6	356.0	10.6	Cinc.	1
1879.3	354.9	10.7	,,	3–2
1890.4	354.6	10.3	Glasenapp	2

Common p.m. of 0″.085 towards 258°.5.

C. P. D. mag. = 6.3.

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No. 35. Ternary System. Lac. 7215. MAG. 5.9

17h 12m 8s — 34° 52′.7.

A = 6.1 B = 8.1 C = 10.0

A and B = Melbourne [4]

1867.64	Companion 8th Mag. preceding		Melbourne	3 n
	°	″		
1876.52	240. ±	1.8 ±	β	1
1877.53	226.3	1.68	Howe	1
1877.64	224.4	1.97	Russell	1
1888.72	147.5	1.88	β	1
1889.43	134.1	1.35	,,	3
1889.63	131.9	0.97	Pollock	1
1891.53	82.3	0.51	β	3
1892.38	24.4	0.58	,,	4
1894.57	330.8	0.94	Sellors	7–2
1894.63	334.1	1.31	Barnard	4
1895.60	321.7	0.91	Comstock	2–1
1895.62	322.2	1.43	Sellors	3
1895.74	320.0	1.3 ±	See	1
1896.59	315.8	1.87	Sellors	4
1896.44	314.8	1.45	Aitken	1
1896.60	314.9	1.26	Comstock	1
1897.39	307.0	1.69	See	1
1897.52	310.2	1.86	Lehman	4

A or A + B and C = *h* 4935

	°	″		
1837.4	130. ±	.....	*h*	1 n
1875.5	130.5	29.44	C. Z. C.	1
1876.5	130. ±	.....	β	1
1877.6	132.4	.....	Russell	1
1889.4	128.6	31.03	β	3
1891.5	128.8	30.52	,,	3
1892.4	129.4	30.55	,,	2
1897.4	129.3	29.98	See	1

C. P. D. mag. = 7.2.

This, one of the most important ternary systems known, has a common p.m. of 1″.15 towards 98°.1.

The close pair was, as noted above, discovered at Melbourne in 1867, and was recorded in the volume of *Melbourne Observations* published in 1869. It was noted nine years later as β 416, and again, in the following year, as Russell 298.

Some care has been taken to give the measures, etc., correctly. Prof. Howe's is often quoted with corrections which are not of great weight, and are here omitted. Mr Russell's distance is 1″.97 as printed, not 1″.77 as sometimes quoted. When Mr Russell observed the system in 1877, he noted the third star as 7th mag.

The close pair is so easy in that part of the orbit where the *comes* precedes, that had it been preceding in 1837, *h* could hardly have overlooked it.

Orbits have been computed by Glasenapp, Gore, Burnham, and See. Prof. See's elements are:—

P = 33 years.
T = 1891.8
a = 1″.22
e = 0.512
i = 37°.3
Ω = 144°.6
λ = 86°.1

Assuming the mass of the close pair to be equal to that of the Solar System, the parallax would be 0″.12.

If the third star did not share in the proper motion of the close pair, its distance in 1875 — using β's measure of 1892 as basis—should have been about 50″ not 29″ as actually observed.

Assuming that we now see the third star at a distance equal to its semiaxis major, its period of revolution, by Kepler's Law, would not be greatly different from 4000 years.

Papers:—

1891. Burnham, *Sidereal Messenger*, vol. x. pp. 489–491.

1893. Gore, *M. N. R. A. S.*, vol. liii., pp. 335–6.

,, Glasenapp, *Astronomy and Astrophysics.*

1894. ,, *Proc. Roy. Soc. of N. S. Wales*, 1894, pp. 59–62.

1898. Innes, *M. N. R. A. S.*, vol. lviii. pp. 90–91.

No. 36. Washburn 132. C. Z. 17 h. 770. MAG. 8.9

17h 12m 50s — 23° 53′.4.

9.3 and 10.4

	°	″		
1888.6	30.0	1.96	Washburn	3 n

C. Z. 17 h. 774, mag. 9.2, is closely S.f.

No. 37. β 126. Piazzi 17 h. 43. 6.0

17h 14m 4s — 17° 39′.1.

6.3 and 8.2

	°	″		
1875.1	261.3	1.74	Dembowski	5 n
1877.4	260.4	1.56	Cinc.	2
1879.5	261.3	1.24	β	2
1879.6	262.0	1.81	Schiaparelli	4
1888.5	263.4	1.89	Haverford	2
1890.5	262.8	2.20	Glasenapp	2
1892.4	262.0	1.67	β	3
1897.4	262.4	1.66	Scott	2

Fixed.

β has measured a 12th mag. star 12″ S.f., first noted by Prof. Howe.

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No. 38. Harvard 144. Piazzi 17 h. 48. MAG. 8.0
17h 14m 18s — 26° 26′.8.

Both = 8.8

1868.6	24.°6	4.″39	Harvard	1 n
1898.5	13.0	4.50	See	1

Prof. See also measures a star 38″ distant.
Harvard:—"Another double star f."
A 5″ pair of faint stars, noted as β 127, is nearly 1° S.

No. 39. Harvard. Lac. 7213. 6.4
17h 14m 18s — 57° 54′.6.

Noted as triple at Arequipa in 1891.
From *Harvard Circular*, No. 18.
The p.m. of the chief star is very small.

No. 40. Ormond Stone. Ö.A. 16,653. 9.1
17h 15m 23s — 17° 56′.1.

9.5 and 10.5

1880.4	44.°3	0.″8 ±	Cinc.	2 n

Close to another star of the same mag.

No. 41. λ 325. Lac. 7246. 7.6
17h 15m 44s — 30° 24′.1.

Comes = 10.1

1897.5	232.°8	4.″24	See	1 n

No. 42. Harvard. ι Arae. 5.4
17h 15m 46s — 47° 22′.2.

Noted as double within 30″ at Arequipa in 1891.
From *Harvard Circular*, No. 18.
The p.m. of the chief star is about 0″.1 towards 180°.

No. 43. λ 326. Ö.A. 16,672. 8.5
17h 16m 6s —20° 38′.5.

9.0 and 9.5

1897.6	13.°7	0.″59	See	1 n

No. 44. h. 4942. γ Arae. MAG. 3.4
17h 16m 59s — 56° 17′.0.

Comes = 11.4

1836.3	323.°1	18.″ ±	*h*	1 n
1872.5	329.5	16.7	Russell	1
1882.7	328.5	16.8	Hargrave	1
1897.1	328.6	18.6	See	1

Another star, 11th mag., 28″ away.
The chief star has a p.m. of 0″.028 towards 248°.8.
Also registered as a new triple or multiple in *Harvard Circular*, No. 18, probably in addition to *h*'s stars, as in the *Circular* it is remarked that all *h*'s stars are rejected, and that T may signify a multiple star.

No. 45. Washburn 133. Ö.A. 16,701. 8.2
17h 17m 38s — 21° 37′.0.

8.8 and 9.2

1888.6	166.°0	1.″16	Washburn	3 n
1890.5	161.1	0.82	Hough	1

No. 46. h. 4945. C. Z. 17 h. 1088. 9.0
17h 17m 55s — 47° 49′.3.

Comes = 9.8

1834.5	111.°4	4.″ ±	*h*	1 n
1882.7	112.6	5.27	Hargrave	1

No. 47. Washburn 28. Ö.A. 16,709. 8.1
17h 18m 3s — 30° 26′.0.

8.6 and 9.1

1874.0	S.pr.	.....	Cordoba	1 n
1881.6	236°.8	3″.42	Washburn	3
1888.4	232 .8	3 .51	„	1

No. 48. Harvard. κ Arae. 5.3
17h 18m 12s — 50° 32′.5.

1891 Triple within 30″ Arequipa - n
From *Harvard Circular*, No. 18.
The p.m. is very small.
C. P. D. mag. = 7.2.

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No. 49. β 242. Lal. 31,610. MAG. 7.8
17h 18m 29s — 11° 35′.9.

8.3 and 8.9

1874.6	69°.4	0″.92	Dembowski	1 n
1875.9	68.8	0.95	„	4
1879.6	73.4	0.9 ±	Schiaparelli	3
1888.5	74.0	0.99	Haverford	1
1892.5	70.9	0.99	„	3

Two other companions :—
11.5 mag. at 9″
10.5 „ 48″

No. 50. Washburn 134. Mayer 701. 6.5
17h 18m 43s — 21° 20′.9.

Comes = 12.3

1889.1	149°.4	3″.98	Washburn	4 n
1898.3	152.5	3.99	See	1

The p.m. of the chief star is about o″.04.

No. 51. Σ 2156. Lal. 31,647. 8.5
17h 18m 48s — 0° 44′.6.

9.0 and 9.7

1829.5	31°.8	3″.54	Σ	1 n
1831.4	32.6	3.14	„	2
1848.6	34.7	3.00	Mitchel	1
1878.9	34.9	3.37	Cinc.	3
1896.6	37.7	3.32	Pritchett	3

Other measures.

No. 52. h. 4949. Piazzi 17 h. 73. 5.3
17h 19m 29s — 45° 45′.2.

5.6 and 6.9

1836.4	267°.4	3″.23	*h*	4 n
1856.4	266.0	2.51	Jacob	2
1878.7	264.7	2.77	Melbourne	1
1880.7	263.2	1.82	Hargrave	1
1886.6	262.7	2.34	Pollock	1
1886.6	264.9	2.78	Tebbutt	2
1890.6	260.7	2. ±	Sellors	1

A slow decrease in the angle.

A 7.7 mag. star about 2′ N.pr. makes, with the above pair, the old pair Dunlop 216.

No. 53. Harvard. Lac. 7265. MAG. 6.3
17h 20m 0s — 52° 12′.5.

C. P. D. mag. = 7.4.

No. 54. Harvard. Lac. 7263. 6.0
17h 20m 22s — 55° 5′.0.

The above two stars have been noted as triple at Arequipa.

See *Harvard Circular*, No. 18.

No. 55. β 128. Lal. 31,668. 7.3
17h 20m 38s — 26° 14′.7.

Comes = 10.0

1876.6	327°.3	3″.66	Cinc.	1 n
1877.5	324.9	4.05	„	2
1891.6	328.0	4.04	β	3
1897.7	322.8	3.97	See	2

The p.m. is very small.

Equal to Harvard 146.

No. 56. Dunlop 217. Lac. 7288. 6.6
17h 21m 46s — 43° 53′.4.

C. Z. 17 h. 1348 = 8.5

1836.2	171°.3	14″.5	*h*	2 n
1881.8	170.2	13.3	Hargrave	1

Called *h* 4953 in error in the *Sydney Catalogue*.

No. 57. β 129. Piazzi 17 h. 100. 7.3
17h 22m 28s — 25° 25′.6.

8.0 and 8.2

1878.4	99°.1	0″.99	Cinc.	2 n
1880.6	99.4*	1.10	Schiaparelli	3
1889.1	100.0	0.93	β	3
1893.6	100.1	0.87	Sellors	2
1897.6	99.0	0.93	Aitken	3
1897.7	106.4	1.02	See	1

Discovered a second time as β 1120.

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No. 58. λ 329. Ö.A. 16,826. MAG. 8.4
17h 22m 48s — 23° 21′.5.

Comes = 12.0

1897.7	112°.2	3″.42	Cogshall	1 n

Found by Mr Cogshall.

No. 59. Howe 47. Lac. 7312. 6.8
17h 23m 30s — 33° 38′.2.

7.0 and 9.0

1877.7	320°.0	4″.10	Cinc.	1 n
1881.4	324.7	4.65	β	3
1893.5	323.5	4.16	Hough	1
1897.4	319.2	4.42	See	1

Prof. Hough measures a 12.5 mag. star at 15″.
C. Z. 17 h. 1484, mag. 9.0, is about 1′ N.f.

No. 60. Σ 2171. Piazzi 17 h. 110. 7.5
17h 23m 46s — 9° 54′.6.

8.1 and 8.4

1830.5	75°.7	1″.62	Σ	4 n
1841.5	71.9	1.66	OΣ	1
1848.6	68.1	1.41	Mitchel	1
1856.5	70.0	1.52	Secchi	2
1868.3	69.1	1.58	Dembowski	5
1879.3	69.0	1.58	Cinc.	2
1880.6	67.8	1.59	Pritchett	3
1888.5	68.2	1.48	Haverford	3–2
1893.5	67.4	1.63	Bigourdan	1
1896.6	68.0	1.86	Pritchett	2–1

Slow decrease in angle.

No. 61. λ 330. ÖA. 16,837. 8.7
17h 23m 48s — 30° 10′.7.

9.0 and 10.7

1897.5	169°.1	1″.62	See	1 n

No. 62. λ 331. Lac. 7304. 7.5
17h 24m 6s — 48° 40′.5.

7.8 and 9.0

1897.2	193°.8	0″.70	See	1 n

A 9.8 mag. star is 1′.5 N.pr.

No. 63. Howe 48. C. Z. 17 h. 1538. MAG. 7.5
17h 24m 25s — 38° 56′.4.

7.8 yellow, and 9.1 bluish

1876.2	230°.±	2″.±	Howe	1 n
1896.6	230.5	3.20	Sellors	3
1896.9	230.7	3.08	See	3

No. 64. Innes 40. Lac. 7308. 6.5
17h 24m 25s — 45° 57′.6.

Comes = 10.5

1895.8	S.pr.	6″.±	Innes	1 n

Lac. 7310, mag. 7.5, orange-coloured, is 4′ S.f.

No. 65. β 1089. Lal. 31,816. 6.6
17h 24m 27s — 5° 50′.3.

Comes = 11.0

1888.64	5°.2	0″.95	β	3 n
1897.52	354.6	0.92	Aitken	3

No. 66. Washburn 136. Lac. 7315. 7.3
17h 24m 40s — 40° 57′.8.

7.9 and 8.3

1882.±	95°.±	1″.±	Washburn	1 n
1896.6	110.0	1.39	Sellors	3

C. Z. 17 h. 1545, mag. 8.5, is closely S.pr.

No. 67. h. 4957. C. Z. 17 h. 1560. 8.8
17h 24m 56s — 46° 33′.2.

9.5 and 9.7

1834.5	93°.0	1″.7±	*h*	1 n
1880.7	270.±	1.0±	Hargrave	1
1897.2	266.6	2.86	Lowell	2

No. 68. Innes 105. C. Z. 17 h. 1604. 8.4
17h 25m 11s — 30° 12′.9.

9.1 and 9.3

1898.3	167°.7	1″.90	See	1 n

C. Z. 17 h. 1603, mag. 7.9, is 2′.8 N.pr.

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No. 69. Σ 2173. Pos. Med. 1949. MAG. 5.4
17h 25m 15s — 0° 58′.8.

6.0 and 6.4, both yellow

1829.6	147°.2	0″.62	Σ	2 n
1831.7	141.5	0.62	,,	3
1836.7	Single		,,	4
1840.6	358.8	0.61	OΣ	3
1846.5	336.1	0.85	,,	5
1851.7	335.6	1.18	Mädler	2
1858.6	328.3	0.88	,,	4–2
1864.5	Single		Dembowski	1
1866.3	180.7	0.47	OΣ	3
1872.1	155.7	0.89	,,	5
1876.6	144.0	0.61	,,	2
1881.5	114.9	0.24	β	3
1883.9	24.8	0.22	Engelmann	9
1888.5	344.4	0.53	Hall	3
1891.5	340.1	0.97	,,	3
1895.6	337.7	1.13	Comstock	3
1897.7	337.0	1.20	Doolittle	3
1898.5	335.5	1.34	Solá	2

Common p.m. of 0.″2.

The close pair is a well-known binary, for which Prof. See gives the following orbit (*Evolution of Stellar Systems*).

P = 46 years
T = 1869.5
a = 1″.14
e = 0.20
i = 80°.75
☊ = 153°.7
λ = 322°.2

The relative positions for future observations can be found approximately by adding forty-six years to the dates given above.

A 10th mag. star 7″ pr. was seen at Cincinnati in 1883, but its real existence has been doubted. β with the 36-in. Lick Refractor could not find it in 1890.

No. 70. Washburn 29. Ö.A. 16,893. 8.4
17h 25m 53s — 30° 22′.9.

8.9 and 9.5

1881.4	230°.2	1″.35	Washburn	3 n
1888.6	229.4	1.58	,,	3
1897.6	230.9	1.50	See	1

There is a somewhat similar pair 10′ N, 42 secs. pr.

In Prof. See's list Washburn 29 is identified as C. Z. 17 h. 1564, a star 69 secs. pr. 9′ N.

No. 71. Harvard. Lac. 7321. MAG. 6.7
17h 27m 14s — 53° 17′.0.

1891	Triple within 30″	Arequipa	–n

No. 72. h. 4962. Lac. (7345). 5.8
17h 28m 10s — 32° 30′.8.

Comes = 10.5

1836.5	98°.8	5″.±	*h*	2 n
1877.5	102.9	4.92	Cinc.	1
1893.5	103.2	5.04	Hough	1
1893.6	99.8	4.81	Sellors	1
1897.6	101.7	6.08	See	1

An 11th mag. star, 13″ distant, first noted by Prof. Hough.

There are several other stars near making a fine low power field.

The p.m. is inconsiderable.

No. 73. h. 4963. C. Z. 17 h. 1894. 8.0
Yellow
17h 29m 34s — 41° 52′.1.

Comes = 9.5 yellowish

1834.5	327°.6	8″.±	*h*	1 n
1897.7	315.8	6.73	See	1

Two stars, 8th to 9th mag., are N.pr.

No. 74. Innes 106. Lac. 7344. 7.7
17h 29m 35s —49° 10′.8.

8.1 and 9.1

1897.7	30°.±	0″.8±	Innes	2 n

A fainter star is 3′ N.f.

λ Aræ, 4.9, mag., is 12′ S.f.

No. 75. λ 335. θ Scorpii. 2.0
17h 30m 8s — 42° 56′.1.

Comes = 14.0

1896.7	321°.5	6″.24	See	6 n
1897.4	316.9	6.77	,,	2

The p.m. of the chief star is 0″.021 towards 235°.7

See :—

1896. See, T. J. J., "Discovery," *Astr. Nach.*, No. 3387.

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No. 76. Innes 247. Lac. 7357. MAG. 7.1
17h 31m 1s — 37° 47′.7.

7.2 and 9.5

1897.7	120°. ±	1″. ±	Innes	2 n

There is a coarse double about 10′ N.pr.

No. 77. Washburn 30. Lal. 32,046. 8.0
17h 31m 43s — 23° 19′.6.

8.3 and 9.5

1881.4	111°.7	3″.27	Washburn	3 n
1888.6	111.7	3.34	,,	3

No. 78. Innes 107. Messier 6, C. G. A. 10. 8.9
17h 33m 0s — 32° 17′.5.

9.3 and 10.3

1896.7	130°. ±	1″.5 ±	Innes	1 n

Closely S.pr. Piazzi 17 h. 159, an outlier of the scattered cluster, Messier 6.

The mag. is taken from the C. G. A., as the Cor. D.M. magnitudes of this cluster are too faint.

No. 79. β 960. Lal. 32,122. 9.0
17h 33m 5s — 1° 5′.5.

Comes = 12.4

1880.5	294°.9	3″.18	β	4 n
1891.6	301.2	2.98	,,	3

No. 80. Washburn 31. B.D.—14°, 4712. 9.7
17h 33m 17s — 14° 46′.8.

10.3 and 10.6

1881.4	338°.2	1″.38	Washburn	2 n
1888.6	332.0	1.90	,,	3

No. 81. Pollock [4]. Lac. 7365. 7.8
17h 33m 26s — 53° 25′.0.

Comes = 9.0

1887.6	296°.4	10″.82	Pollock	2 n

No. 82. Hargrave 124. C. P. D. —52°, 10,777. MAG. 8.6
17h 34m 2s — 52° 44′.6.

Both = 9.4

1882.7	126°.7	4″.57	Hargrave	1 n
1887.6	126.3	4.83	Pollock	3

No. 83. Pollock [5]. C. Z. 17 h. 2246. 7.8
17h 34m 36s — 34° 54′.9.

8.3 and 8.8

1886.6	258°.2	4″.53	Pollock	1 n
1887.7	256.8	4.97	,,	2

No. 84. h. 4970. Lac. 7377. 7.5
17h 34m 36s — 48° 35′.4.

8.0 and 8.6

1834.5	74°.0	4″. ±	*h*	1 n
1881.7	70.8	7.22	Hargrave	1
1897.2	69.0	7.95	See	1

The companion is C. Z. 17 h. 2226.

C. Z. 17 h. 2220, mag. 9.1, is 4.5 secs. pr.

No. 85. β 631. Piazzi 17 h. 182. 6.5
17h 34m 49s — 0° 35′.0.

7.2 and 7.3

1878.6	70°.2	0″.37	β	2 n
1880.5	75.7	0.42	,,	2
1883.9	72.2	0.41 ±	Schiaparelli	7
1886.6	65.8	0.36	Engelmann	7
1887.6	62.3	0.37 ±	Schiaparelli	5
1888.5	57.2	0.44	Haverford	3–1
1891.6	67.2	0.36	β	3

There seems to be a decrease of angle in this very close pair.

No. 86. Harvard. Lac. 7381. 6.5
17h 36m 19s — 57° 29′.7.

1891	Double within 30″		Arequipa	–n

(*Harvard Circular*, No. 18.)

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No. 87. Russell 303. C. P D.—54°, 8468. MAG. 7.5
17h 36m 53s — 54° 5′.3.

7.8 and 9.0

1880.6	109°.7	2″.54	Russell	1 n
1887.6	109.7	3.53	Pollock	2

The co-ordinates furnished by Russell and Pollock differ between themselves by over 1°, and neither are correct.

No. 88. Cape 17. Lac. 7399. 7.7
17h 37m 48s — 50° 44′.0.

8.4 and 8.6

1890.7	217°.9	0″.90	Sellors	1 n
1891.6	218.8	1.36	„	1

See *Cape Results*, 1876, where, however, the note of duplicity is set against the wrong star by error. The correct star is indicated in the *Cape* 1880 *Catalogue*.

No. 89. Innes 248. Lac. 7407. 8.0
17h 38m 13s — 46° 52′.5.

8.2 and 9.7

1897.8	120°.±	2″.±	Innes	1 n

No. 90. h. 4975. Lac. 7413. 6.4
17h 40m 18s — 55° 21′.9.

Comes = 9.5

1835.37	115°.7	2″.±	*h*	1 n
1837.66	81.4	1.51	„	1
1871	Not seen, bad defn.		Russell	1
1880–1	Not divided, etc.		Sydney	4
1880.55	95°.2	2″.67	Cruls	1

Found single at Melbourne on two nights, 1878.8.
h:—"Certain; quite sure; no doubt whatever."

No. 91. Innes 108. Cor. D.M.—40°, 11,849. 9.3
17h 40m 59s — 40° 6′.1.

9.8 and 10.5

1896.5	.....	1″.5±	Innes	2 n

ι_1 Scorpii, mag. 3.1, is 24 secs. pr. 1′ N., and has a faint companion at 38″ measured as λ 338.

No. 92. h. 4978. Lac. 7426. MAG. 5.8
17h 42m 20s — 53° 34′.7.

Comes = 9.9

1834.9	269°.5	12″.1	*h*	2 n
1878.8	269.4	12.6	Melbourne	1
1881.7	276.5	11.9	Hargrave	1

The chief star was formerly called ν_1 Arae.

No. 93. Harvard. Lac. 7419. 5.7
17h 42m 36s — 60° 7′.9.

1891 Double within 30″ Arequipa – n

See *Harvard Circular*, No. 18.
C. P. D. mag. = 7.2.

No. 94. h. 4979. Lac. 7421. 7.1
17h 43m 2s — 60° 21′.7.

7.3 and 9.0

1835.7	240°.3	10″.±	*h*	2 n
1877.7	236.7	10.8	C. G. A.	4
1887.7	237.9	10.4	Pollock	2

No. 95. h. 4981. Lac. 7437. 7.5
17h 43m 10s — 50° 15′.6.

Both = 8.3

1834.5	205°.9	1″.5±	*h*	1 n
1882.6	198.2	2.23	Hargrave	1

Combined mag. in C. P. D. = 8.6.

No. 96. Harvard. ι_2 Scorpii. 4.9
17h 43m 11s — 40° 3′.5.

1891 Double within 30″ Arequipa – n

(*Harvard Circular*, No. 18.)

No. 97. β 824. Lal. 32,516. 8.7
17h 43m 42s — 1° 50′.2.

9.4 and 9.5

1881.4	350°.9	0″.67	β	3 n
1888.5	349.4	0.69	Washburn	3

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No. 98. Harvard. Piazzi 17 h. 236. MAG. 6.5
17h 44m 31s — 40° 44′.5.

1891 Double within 30″ Arequipa –n

See *Harvard Circular*, No. 18.

C. P. D. mag. = 8.0

No. 99. Howe. C. Z. 17 h. 2997. 8.4
17h 45m 54s — 28° 27′.1.

A = 8.7 B = 10.5 C = 10.9

A and B (+C)

1877.6	11°.3	6″.26	Cinc.	1 n
1880.4	8.7	6.54	„	2
1889.4	9.6	6.46	β	3
1897.6	10.4	6.41	Aitken	2

B and C = [β 1122]

1889.4	175°.2	1″.31	β	3 n
1897.6	170.6	1.47	Aitken	3
1898.3	171.3	1.80	See	1

The first measure of B and C is by β, who registers it as a new pair; but the duplicity seems to have been known at Cinc. in 1877. See Observations for that year, page 41.

Aitken measures a 12th mag. star N. 12″.3, and another in the same direction at 20″. See

No. 100. β 1123. Bris. 6236. 6.3
17h 46m 40s — 34° 42′.2.

6.9 and 7.3

1889.5	212°.8	0″.58	β	3 n
1897.6	220.4	0.27	See	2

In a large cluster. See also the next star.

No. 101. λ 342. Piazzi 17 h. 254. 5.7
17h 46m 43s — 34° 52′.3.

6.2 and 6.8

1897.6	284°.6	0″.42	See	1 n

C. P. D. mag. = 7.4

No. 102. Hough 422. W.B. 17 h. 893. 8.8
17h 47m 15s — 5° 17′.7.

9.2 and 10.0

1893.6	19°.8	0″.48	Hough	3 n
1896.6	18.7	0.49	„	2–1

The pr. and faintest star of a small triangle.

No. 103. Washington. Ö.A. 17,320. MAG. 8.1
17h 47m 28s — 28° 40′.0.

8.5 and 9.5

1880.5	2°.2	2″.01	Cinc.	1 n

No. 104. Σ 3128. Lal. 32,664. 7.5
17h 47m 33s — 7° 53′.3.

Comes = 10.5

1831.4	31°.4	1″.51	Σ	1 n
1835.6	24.0	1.52	„	2
1867.7	27.4	1.53	Dembowski	4
1878.3	35.0	1.25	β	1
1879.5	32.0	1.51	Cinc.	1
1886.3	26.0	1.19	L. McC.	1

Fixed, but with a common p.m. of 0″.234 towards 206°.4.

Σ 2234, a 17″ pair, is 15 secs. pr. 2′ S.

No. 105. h. 4992. C. P. D.—57°, 8803. 8.0
17h 48m 52s — 57° 38′.6.

8.5 and 9.2, both yellow

1835.9	3°.0	5″.±	h	2 n
1872.6	5.4	5.18	Russell	1
1879.7	11.2	4.31	Hargrave	1

No. 106. Cape 18. Lac. 7472. 7.0
17h 48m 53s — 55° 21′.8.

7.4 and 8.2

1874.5	Dpl. c.		C. G. A.	5 n
1875.5	Close, star f.		Cape	3
1880.6	82°.5	2″.72	Russell	1
1890.7	88 .8	2 .01	Sellors	2
1891.6	89 .6	2 .13	„	1
1894.7	89 .0	2 .14	„	1

No certain change.

Published in 1877 in the volume of *Cape Results* for 1875; also registered as Russell 304.

No. 107. Washburn 139. Piazzi 17 h. 276. 6.8
17h 49m 21s — 11° 36′.8.

Comes = 11.0

1888.6	154°.2	3″.71	Washburn	3 n
1890.6	155.1	3.56	Hough	1

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No. 108. Innes 109. C. Z. 17 h. 3241. MAG. 9.3
17h 49m 24s — 28° 3′.6.

9.7 and 10.5

1896.5	S.pr.	2.″5 ±	Innes	3 n

No. 109. Cordoba [50]. C. Z. 17 h. 3258. 7.3
17h 49m 52s — 39° 55′.0.

7.5 and 9.1

1880.6	120.°6	3.″99	C. G. A.	3 n

No. 110. Russell 306. Lac. 7510. 7.1
17h 51m 12s — 35° 59′.7.

7.3 and 9.1

1880.8	14.°8	2.″59	Russell	1 n
1896.7	15.2	2.89	See	3–2

Prof. See also notes a 13th mag. star 11″ f. = λ 343.

No. 111. h. 4996. C. Z. 17 h. 3314. 8.2
17h 51m 22s — 62° 9′.0.

8.6 and 9.6

1836.5	247.°6	3.″ ±	*h*	1 n
1887.7	248.7	6.08	Pollock	3–1

The companion was not found by Mr Russell in 1871 (one night).

Both components have been observed on the meridian at Cordoba.

No. 112. Innes 110. Lac. 7503. 7.5
17h 51m 52s — 47° 45′.8.

7.7 and 9.7

1896.7	125.° ±	1.″5 ±	Innes	2 n

Followed by Lac. 7505, mag. 7.2, and Bris. 6266, mag. 8.3.

No. 113. λ 344. Yarnall, 7669. 8.5
17h 52m 4s — 36° 51′.1.

Comes = 12.6

1896.7	156.°9	1.″47	See	2 n

Lac. 7513, mag. 6.3, is 4 secs. f.

No. 114. h. 5000. Lac. 7516. MAG. 7.3
17h 52m 26s — 36° 55′.7.

Comes = 9.5

1837.0	107.°3	6.″84	*h*	2 n
1851.0	108.1	6.92	Jacob	2–1
1896.7	105.8	7.52	See	4

Perhaps only remarkable as the 5000th new pair recorded by Sir John Herschel, and yet his double star work was only a portion of what he did for astronomy.

No. 115. h. 5003. Piazzi 17 h. 294. 5.1
17h 52m 40s — 30° 14′.6.

5.3 orange, and 7.0 blue

1836.8	107.°1	6.″20	*h*	2 n
1877.5	105.6	5.56	Cinc.	3
1882.7	105.1	4.79	Hargrave	1
1890.4	105.5	5.17	Glasenapp	2
1893.0	103.6	5.47	Scott	4
1897.8	[88.7]	5.95	Lowell	2

Common p.m. of about 0″.06.

C. P. D. mag. = 8.0.

Noted as triple at Arequipa in 1891 (see *Harvard Circular*, No. 18), the third star being 27″ S.pr. according to a measure by Prof. See.

No. 116. Innes 230. C. P. D.—37°, 7765. 8.6
17h 53m 41s — 37° 41′.6.

9.0 and 9.8

1897.4	145.° ±	4.″ ±	Innes	2 n

C. P. D.—37°, 7766, mag. 9.4, is 60″ S.f.

These stars are not contained in the Cor. D.M.

No. 117. Washburn 140. Bruxelles 7286. 8.2
17h 55m 7s — 20° 47′.7.

8.5 and 9.7

1888.7	265.°6	2.″19	Washburn	3 n

An 8.0 mag. star is 12′ S.pr.

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No. 118. Ormond Stone. Ö.A. 17,488. MAG. 8.3
17h 55m 46s — 27° 30′.7.

8.8 and 9.3

1876.5	162°.6	2″.99	Cinc.	2 n
1877.6	164.5	3.34	„	2–1
1897.7	162.9	3.38	See	2

No. 119. β 283. Mayer 728. 5.8
17h 55m 51s — 22° 46′.7.

Comes = 12.2

1878.7	239°.3	8″.12	β	5 n
1892.4	238.6	8.17	„	2
1895.5	237.7	8.45	Lick	3

Probably fixed.
A 14th mag. star is 14″ away.

No. 120. β 47. Lal. 32,978. 7.6
17h 55m 59s — 10° 13′.7.

Comes = 10.5

1875.7	268°.3	1″.84	Dembowski	4 n
1891.6	273.8	1.37	β	3
1895.6	277.1	1.46	Lick	3
1896.6	273.2	1.64	Leavenworth	3

"Probably some change":—β.

No. 121. The Trifid Nebula.
17h 56m 19s — 23° 1′.7.

Herschel, β, and other astronomers have measured some stars here.
β remarks:—"Relatively fixed; uninteresting."
A 9th mag. star, with a *comes* = 10.5, distant 2″, is the closest pair in the region measured so far.

No. 122. Harvard. Lac. 7473. 5.6
17h 57m 16s — 75° 53′.5.

1891 Double within 30″ Arequipa ∞ n
(*Harvard Circular*, No. 18.)
C. P. D. mag. = 7.8.

No. 123. ℍ. I. 88. τ Ophiuchi. MAG. 4.9
17h 57m 38s — 8° 10′.8.

5.4 and 6.0, both yellow

1783.3	331°.6	″	ℍ	1 n
1803.6	360. ±	.....	„	2
1825.7	Single		Σ	3
1836.7	199.9	0.43	„	5
1841.7	225.7	0.79	Dawes	1
1846.6	230.0	0.70	Cinc.	6
1852.6	239.5	1.10	Jacob	2
1879.3	247.9	1.63	β	2
1892.6	254.6	1.78	Comstock	4
1896.4	256.2	2.02	Hussey	3

Other measures.
Binary.
The period, according to Dr Doberck, is 218 years.
The p.m. is small.
Equal to Σ 2262.
There is a 9.5 mag. star 100″ away.
See also:—
1897. Burnham, S.W., "Orbits," *Popular Astronomy*, vol. iv. pp. 347–351.

No. 124. Cinc. C. P. D. —25°, 6276. 8.7
17h 57m 49s — 25° 28′.7.

9.4 and 9.6

1880.6	15°.9	4″.46	Cinc.	1 n

Discovered by Prof. H. V. Egbert.

No. 125. Harvard. Lac. 7542. 6.4
17h 58m 6s — 35° 54′.2.

1891 Double within 30″ Arequipa ∞ n
(*Harvard Circular*, No. 18.)

No. 126. Triple. Yarnall, 7743. 9.5
17h 58m 7s — 24° 14′.8.

A = 10.2 B = 11.0 C = 11.1

A and B = β 1126

1889.4	55°.6	0″.63	β	4 n

[contd.

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A and B + C = *h* 5009

1837.7	20.°8	2.″±	*h*	1 n
1880.0	20.0	3.92	Cinc.	2
1889.4	23.3	4.05	*β*	4

In the cluster Messier 8. *h* 5010 is closely S.f., see next star.

The mag. from the Cor. D.M. is fully one mag. less than recorded by the double star observers; the C. P. D. gives 8.4.

No. 127. h. 5010. C. P. D.—24°, 6186. MAG. 9.2
17h 58m 34s — 24° 21′.1.

9.7 and 10.2

1836.1	351.°2	3.″±	*h*	2 n
1879.5	348.0	3.79	Cinc.	3
1897.7	349.9	3.65	See	1

No. 126 is N.pr. in the same field.

No. 128. Howe 50. Lac. 7551. 7.7
17h 58m 58s — 36° 35′.0.

7.9 and 9.4

1876.3	360.°0	1.″3±	Howe	1 n
1876.7	N.	5.0±	C. G. A.	1
1896.6	3.5	3.20	See	4
1896.6	2.9	2.94	A. G. Clark	1

The last measure is from Prof. See's list.

No. 129. h. 5014. Piazzi 17 h. 341. MAG. 5.2
17h 59m 36s — 43° 25′.8.

Both = 6.0

1836.7	69.°1	0.″67	*h*	2–1 n
1856.7	312.3	0.5±	Jacob	1
1857.7	317.2	0.6±	,,	1
1878.7	268.0	1.38	Melbourne	1
1880.5	264.4	0.6±	Cruls	2
1880.5	259.3	0.81	Russell	1
1886.6	254.8	1.27	Pollock	1
1887.8	253.0	1.38	,,	3–2
1893.6	248.1	1.02	Sellors	3
1895.6	247.3	1.47	,,	3
1896.6	245.6	1.49	,,	3
1897.4	243.4	1.72	Lowell	3

180° has been added to all the angles since 1878. The components are very nearly equal in mag., but on several occasions the writer has thought the small star precedes.

A binary pair in which half the angular orbit has been described in fifty-three years.

One of *h*'s measures is set against *h* 5013, and his identification of the pair as Bris. 6308 is erroneous.

Common p.m. of 0″.14 towards 208°.6.

Papers:—

1897. Innes, *M. N. R. A. S.*, vol. lviii. p. 48.

No. 130. Harvard. Lac. 7507. 6.0
17h 59m 52s — 73° 40′.7.

6.1 and 9.1

1898.4	240.°±	1.″5±	Innes	1 n

(*Harvard Circular*, No. 18.)

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No. 1. h. 5015. Piazzi 17 h. 348. MAG. 7.0
18h 1m 5s — 45° 46′.7.

Comes = 10.8

1836.5	263°.9	3″.±	*h*	1 n
1891.6	258.9	3.19	Sellors	2
1897.2	256.3	4.07	See	2

No. 2. Harvard. Lac. 7540. 6.5
18h 1m 8s — 59° 3′.2.

1891	Double	Arequipa	– n

C. P. D. mag. = 7.8.

No. 3. β 243. Ö.A. 17,669. 8.4
18h 2m 7s — 22° 17′.2.

8.9 and 9.6

1874.5	111°.6	1″.2 ±	β	3 n
1877.6	125.8	0.80	Cinc.	1
1879.6	125.2	0.88	„	1
1881.6	123.3	0.76	β	3
1897.7	124.1	0.52	See	1

Cor. D.M. – 22°, 12,594, mag. 9.7, is 40″ distant.

No. 4. β 244. Lal. 33,188. 7.5
18h 2m 17s — 27° 52′.6.

7.7 and 9.9

1874.5	253°.4	2″.±	β	3 n
1878.6	259.2	2.03	Cinc.	2
1881.6	258.2	2.03	β	3
1892.5	257.9	2.04	Haverford	2
1897.6	257.6	2.38	See	3

Other measures.

The pr. of three stars in the finder.

No. 5. h. 5021. Lac. 7564. 7.0
18h 3m 23s — 56° 25′.2.

Comes = 13.0

1836.4	317°.3	3″.±	*h*	1 n

"Most difficult":—*h*.

C. P. D.—56°, 8652, mag. 9.8, which is marked double in the C. P. D., is 35 secs. pr., and Lac. 7566, mag. 7.7, is closely S.f.

No. 6. β 245. Mayer 736. MAG. 5.6
18h 3m 39s — 30° 44′.6.

5.8 and 7.9

1868.7	6°.6	4″.17	Harvard	1 n
1874.5	354.8	.....	β	4
1877.5	353.8	3.89	Cinc.	1
1888.5	1.9	4.12	Haverford	1
1890.6	351.8	2.99	Sellors	2
1892.5	353.3	3.98	Haverford	2
1893.7	350.4	3.87	Sellors	3
1897.5	353.6	4.67	See	1

It is doubtful if the great changes or jumps shown by the above measures can be real.

At Cordoba in 1878 the *comes* was observed N.f.

100° has been added to the Haverford angle of 1892.5.

Also registered as Harvard 149.

C. P. D. mag. = 7.4.

No. 7. h. 5023. Bris. 6327. 8.0
18h 3m 47s — 40° 26′.9.

8.6 and 8.9

1836.5	275°.8	9″.76	*h*	2 n
1837.5	276.5	8.99	„	1
1879.3	276.3	10.42	C. G. A.	4
1880.7	277.5	5.85	Hargrave	1

The distance of this very easy pair seems to be ill determined.

No. 8. Harvard. ε Telescopii. 4.5
18h 3m 48s — 45° 58′.3.

Comes = 14.0

1891	Double		Arequipa	– n
1897.2	228°.1	21″.2	See	1

C. P. D. mag. = 6.7.

No. 9. Hough 428. C. Z. 18 h. 163. 7.9
18h 3m 56s — 29° 13′.9.

Both = 8.7

1893.54	80°.3	0″.74	Hough	1 n

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No. 10. Triple. Yarnall, 7811. MAG. 8.2
18h 5m 13s — 39° 21′.9.

A = 9.3 B = 9.6 C = 9.5

A and B = β 759

1879.7	118°.1	1″.20	β	1
1886.6	121.7	2.17	Pollock	1
1887.7	122.2	2.12	,,	2
1889.4	121.4	1.81	β	3
1896.7	119.7	1.76	See	2–3

A and C = *h* 5028

1835.8	151°.7	17″.±	*h*	2 n
1879.7	149.2	14.8	β	1
1886.6	148.7	15.3	Pollock	1
1889.4	147.3	14.9	β	3
1896.7	149.7	15.4	See	1

Lac. 7598 is 20 secs. f., and is erroneously identified with the above triple by Prof. See.

No. 11. λ 347. C. Z. 18 h. 244. 8.7
18h 5m 18s — 37° 3′.7.

9.3 and 9.6

1896.7	53°.6	0″.51	See	2 n

C. Z. 18 h. 249, mag. 9.5, is closely N.f.

No. 12. β 132. Lal. 33,327. 6.7
18h 5m 19s — 19° 51′.6.

7.4 and 7.5

1875.0	240°.1	0″.78	Dembowski	4 n
1875.9	238.9	0.90	Schiaparelli	4–1
1877.4	233.2*	0.55 ±	Cinc.	2
1880.1	239.2*	1.03	,,	3–2
1881.6	237.0*	0.79	β	3
1887.6	228.8	0.64	Schiaparelli	2
1888.5	233.2	1.01	Haverford	2
1891.5	230.5	0.83	β	3
1892.5	227.8	0.89	Haverford	2
1895.5	222.4	0.77	Lick	3
1896.5	224.5	0.94	Leavenworth	3
1898.5	224.3	1.25	See	1

A binary system in which the angle is decreasing nearly 1° per annum.

No. 13. Hargrave 128. C. Z. 18 h. 243. 9.0
18h 5m 29s — 49° 56′.4.

Both = 9.8

1882.7	4°.±	2″.±	Hargrave	1 n

No. 14. h. 5027. C. Z. 18 h. 234. MAG. 8.3
18h 5m 32s — 54° 23′.6.

Comes = 9.0

1834.5	60°.2	15″.±	*h*	1 n
1871.5	84.7	13.0	Russell	1
1882.2	94.1	11.9	Hargrave	2
1886.6	95.2	12.9	Pollock	1
1887.8	97.4	11.8	Tebbutt	3
1889.7	98.5	12.3	Pollock	3
1891.6	98.7	12.1	Sellors	1
1896.6	102.8	12.0	,,	3

The measures are discordant.

The change is probably due to a p.m. in one or other of the stars of about 0″.17. If this is so, the minimum distance has now been attained.

No. 15. Hough 429. Ö.A. 17,804. 8.0
18h 6m 6s — 15° 42′.1.

Comes = 12.0

1889.7	24°.0	3″.26	Hough	2 n

An 8.7 mag. star is 7′ N.pr.

No. 16. h. 5029. Lac. 7584. 7.2
18h 6m 28s — 57° 52′.6.

Both = 8.0

1836.5	121°.7	2″.±	*h*	1 n
1871.6	113.2	2.93	Russell	1
1879.7	112.3	1.99	Hargrave	1

Separately observed on the meridian at Cordoba.

No. 17. h. 5032. Bris. 6342. 7.2
18h 6m 36s — 43° 13′.7.

7.3 and 10.3

1837.7	335°.8	1″.5 ±	*h*	1 n

h:—"Positively verified."

Looked for on two occasions in 1856 by Jacob, when no companion was seen; nor seen by Cruls in 1880.

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No. 18. h. 5031. C. Z. 18 h. 354. MAG. 8.0
18h 7m 6s — 47° 23′.7.

C. Z. 18 h. 357 = 9.5

1834.5	100.°9	18.″±	*h*	1 n
1882.7	87.0	23.3	Hargrave	1

Separately observed at Cordoba about 1874, when the *comes* was 0″.7 S.

No. 19. Innes 111. Lac. 7593. 7.2
18h 7m 37s — 56° 40′.7.

7.3 and 9.8

1896.5	310.°±	1.″±	Innes	2 n

No. 20. h. 2822. μ Sagittarii. 4.1
18h 7m 47s — 21° 5′.1.

Comes = 10.4

1831.±	262.°5	12.″±	*h*	1 n
1836.5	259.9	16.1	Munich	–
1878.7	258.5	16.8	*β*	2
1892.6	258.6	17.1	Haverford	2
1897.7	258.1	17.2	See	3

Several more distant stars.
The p.m. of μ Sagittarii is 0″.022 towards 270°.
Also registered as *h* 5035.
Other measures.
Probably identical with H. V. 7.

No. 21. β 131. Lal. 33,443. 7.5
18h 7m 51s — 15° 37′.4.

7.7 and 9.2

1875.0	278.°5	2.″71	Dembowski	4 n
1877.4	277.8	2.60	Cinc.	1
1880.6	279.6	2.71	„	1
1888.5	278.0	2.63	Haverford	1
1892.5	280.2	2.76	„	2

Another *comes*, mag. 11.6, 7″.13 distant in the same direction has been noted by *β*.

No. 22. Washburn 141. Ö.A. 17,868. 8.9
18h 8m 14s — 23° 41′.8.

9.3 and 10.3

1888.7	26.°4	1.″57	Washburn	3 n

No. 23. h. 5034. Lac. 7620. MAG. 7.7
18h 8m 46s — 46° 3′.3.

8.1 and 9.2

1836.9	90.°1	1.″92	*h*	3 n
1856.7	93.0	2.32	Jacob	3
1882.7	102.1	2.37	Hargrave	1
1891.6	92.5	1.67	Sellors	1
1897.2	94.4	2.56	Lowell	2

Probably fixed.

No. 24. λ 348. Piazzi 18 h. 12. 8.3
18h 8m 59s — 24° 1′.6.

8.7 and 9.7

1897.7	310.°1	0.″67	Cogshall	1 n

Found by Mr Cogshall.

No. 25. Washburn 142. Lal. 33,492. 8.5
18h 9m 5s — 11° 15′.7.

9.2 and 9.4

1888.7	243.°2	1.″18	Washburn	3 n

No. 26. Russell 307. C. Z. 18 h. 504. 7.5
18h 9m 7s — 35° 40′.0.

7.9 and 8.9

1880.8	355.°7	1.″71	Russell	1 n

No. 27. β 286. 16 Sagittarii. 6.2
18h 9m 16s — 20° 25′.1.

Comes = 12.1

1878.6	218.°5	5.″67	*β*	3 n
1891.6	216.0	6.03	„	2
1897.7	217.2	6.22	See	1

No. 28. Innes 249. Lac. 7601. 6.4
18h 10m 0s — 63° 54′.8.

Comes = 11.0

1897.8	5.°±	5.″±	Innes	1 n

Difficult with a 7-inch telescope.
Distance a guess.

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No. 29. Σ 2296. 1st Munich 15,767. MAG. 7.5
18h 10m 27s — 3° 23′.3.

Comes = 10.1

1829.5	7.0	3.33	Σ	3 n
1848.6	4.5	3.36	Mitchel	1
1867.2	8.1	2.95	Dembowski	4
1879.3	7.3	3.10	Cinc.	1

Fixed.

No. 30. β 285a. Ö.A. 17,953. 8.6
18h 10m 40s — 25° 2′.5.

9.0 and 10.0

1874.7	317.2	.....	β	1 n
1877.6	316.4	1.34	Cinc.	1
1880.5	315.7	1.75	β	1
1893.5	319.1	1.57	Goodsell Obs.	1
1897.7	321.4	1.49	See	1

See also the next pair which is 60″ S.f.

No. 31. β 285b. Ö.A. 17,954. 9.3
18h 10m 43s — 25° 3′.3.

9.7 and 10.7

1880.5	20.7	1.65	β	1 n
1897.7	21.7	1.31	See	1

See also the preceding pair.

No. 32. β 760. η Sagittarii. 3.0
18h 10m 52s — 36° 47′.5.

Comes = 10.3

1879.7	99.9	2.85	β	5 n
1886.7	99.5	4.36	Pollock	1
1889.4	107.0	3.51	β	3
1895.7	99.2	3.60	Sellors	3
1896.5	101.2	3.65	Aitken	3
1897.4	105.3	3.87	See	2

Common p.m. of 0″.231 towards 225°.2.

C. P. D. mag. = 6.6.

Aitken measures a 13th mag. star at 33″. β has noted a star 93″ distant.

In the list of double stars in *Harvard Circular*, No. 18.

No. 33. β 246. Piazzi 18 h. 26. MAG. 7.6
18h 11m 45s — 19° 42′.5.

8.3 and 8.4

1875.5	108.7	0.42	Dembowski	5–3 n
1877.6	101.4	0.4 ±	Cinc.	1
1878.5	106.5	0.45	„	1
1881.6	110.0	0.47	β	3
1891.6	105.6	0.51	„	2

A star, 7.8 mag., is 12′ N.pr.

h 2827, a faint wide pair in a nebula, is S.pr.

No. 34. β 463. 1st Munich 15,828. 9.3
18h 11m 53s — 16° 53′.6.

9.9 and 10.2

1877. ±	.....	1.3 ±	β	1 n
1896.5	101.3	2.22	Leavenworth	4–3

No. 35. β 639. Lal. 33,642. 7.3
18h 12m 51s — 18° 39′.5.

7.8 and 8.3

1878.62	147.0	0.76	β	1 n
1878.70	163.6	0.38	„	1
1883.12	137.9	0.35 ±	Schiaparelli	2
1891.65	Single		β	1
1892.36	„		„	1

Ö.A. 18,017, mag. 9.0, is 17″ N.f., and has a 13.5 mag. *comes* at 8″ observed as β 300.

This system is the subject of a short paper by β in the *Astronomical Journal*, vol. xii. No. 271, 1892.

The two principal stars have been measured as South and *h* 264.

No. 36. λ ..... Lal. 33,682. 8.5
18h 13m 39s — 19° 46′.3.

9.1 and 9.4

1897.7	226.4	0.98	See	1 n

The discovery of this pair is credited to Argelander by Prof. See. This is an error; Argelander observed the star as single on two nights, and both places being recorded (as Ö.A. 18,039 and 18,040), at first glance these might be taken for observations of separate stars.

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No. 37. Gale. ξ Pavonis. MAG. 4.2 Ruddy
18h 14m 1s — 61° 32′.4.

Comes = 10.0

1895.7	150°.7	3″.07	Sellors	2–1 n

The p.m. of the chief star is 0″.04 towards 284°.5.
C. P. D. mag. = 5.9.

No. 38. Schjellerup$_2$ 24. W.B. 18 h. 262. 7.5
18h 14m 28s — 5° 0′.4.

7.9 and 8.8

1874.5	192°.8	2″.28	Dembowski	3 n
1875.7	195.5	2.56	Schiaparelli	4–3
1879.1	194.2	2.34	Cinc.	2
1888.5	196.2	2.33	Haverford	3
1890.6	199.4	2.97	Glasenapp	2

No. 39. λ 350. δ Sagittarii. 2.7
18h 14m 36s — 29° 52′.2.

Comes = 14.5

1896.7	276°.4	25″.8	See	1 n

The p.m. of the chief star is 0″.035 towards 155°.1.
In the C. P. D. its mag. is 6.2.
Prof. See also measures two more distant stars.
All found by Mr Cogshall.

No. 40. South. Lal. 33,731. 6.5
18h 14m 39s — 8° 1′.4.

Comes = 9.6

1825.2	213°.0	″.....	South	– n
1831.2	216.4	3.22	Σ	5
1848.6	219.9	3.22	Mitchel	1
1855.6	222.9	3.56	Morton	1
1865.6	224.0	3.08	Dembowski	2
1866.7	222.3	3.40	Harvard	2
1877.5	222.4	2.79	Cinc.	2
1880.6	222.5	2.98	Pritchett	4
1887.6	223.3	2.91	Hall	3
1890.5	229.2	3.11	Glasenapp	2
1896.6	224.2	2.37	Pritchett	1

Also known as Σ 2303.
Other measures.

No. 41. β 48. Lal. 33,729. MAG. 7.8
18h 15m 6s — 19° 41′.8.

8.4 and 8.8

1871.6	10°.±	2″.75 ±	β	1 n
1874.9	0.0	2.33	Dembowski	3
1877.6	1.7	2.04	Cinc.	1
1880.6	0.6	2.36	„	1
1886.3	358.8	2.51	L. McC.	1
1892.6	0.2	2.17	Haverford	1

Two faint *comites* pr. have been noted by β.

No. 42. Cordoba [51]. Moesta 1720. 7.9
18h 16m 8s — 42° 49′.5.

8.5 and 8.8

1889.5	137°.0	3″.61	Pollock	2 n

Both stars were observed on the meridian at Cordoba in 1880.

No. 43. Mitchel. Lal. 33,796. 8.2
18h 16m 30s — 15° 8′.3.

8.8 and 9.2

1848.6	63°.8	0″.56	Mitchel	1 n
1865.2	64.3	0.82 ±	Dembowski	6
1877.5	63.8	0.95	Cinc.	2–1
1879.6	64.4	1.27	„	1
1884.6	67.6	1.02	Hall	2
1888.6	68.2	0.78	„	2
1896.6	66.2	0.82	Pritchett	2

Other measures.
Lal. 33,797, mag. 7.5, is 11″.8 N.f., and with the above pair is equal to Σ 2306.

No. 44. β 1252. Lal. 33,818. 8.3
18h 17m 2s — 11° 54′.4.

8.8 and 9.5

1876.7	182°.4	1″.21	Dembowski	2 n
1891.5	182.7	1.23	β	3

No. 45. Hough. Lal. 33,806. 7.9
18h 17m 21s — 26° 13′.1.

8.5 and 8.9

1889.7	140°.±	0″.5 ±	Hough	1 n
1896.5	155.8	0.3 ±	„	1
1897.6	140.5	0.51	See	1

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No. 46. λ 351. ε Sagittarii. MAG. 1.9
18h 17m 32s — 34° 25′.9.

Comes = 13.3

1896.7	295°.1	32″.5	See	2 n

The p.m. of the chief star is 0″.15 towards 203°.3.
C. P. D. mag. = 3.9.

No. 47. h. 5041. Lac. 7675. 7.1
18h 17m 41s — 53° 41′.7.

7.2 and 9.7

1837.4	261°.8	2″.±	*h*	1 n
1872.6	256.8	3.19	Russell	2
1878.8	255.5	3.05	Melbourne	1
1880.7	264.9	1.82	Hargrave	1
1886.6	258.9	2.64	Pollock	1
1889.7	260.6	2.55	,,	4
1890.6	258.1	2.64	Sellors	1
1897.2	258.9	2.83	See	1

Separately observed on the meridian at Cordoba.
Stationary.

No. 48. Pollock [6]. C. Z. 18 h. 1074. 9.0
18h 18m 41s — 36° 47′.2.

Comes = 10.5

1886.7	228°.7	3″.33	Pollock	1 n
1887.7	225.2	3.52	,,	2

There is an 8.7 mag. star 40 secs. pr. 1′ N.

No. 49. λ 352. Ö.A. 18,174. 8.4
18h 19m 12s — 30° 16′.2.

Comes = 13.9

1897.7	72°.3	2″.96	See	1 n

No. 50. Lalande 141. Lal. 33,938. 7.0
18h 19m 21s — 6° 39′.4.

7.4 and 8.5

1832.2	199°.0	6″.13	Σ	3 n
1848.6	197.5	6.79	Mitchel	1
1867.9	199.3	6.10	Dembowski	4
1890.5	198.8	5.87	Glasenapp	2

The *comes* is Radcliffe 1890, 4822.
This pair is also registered as Σ 2313.
Fixed.

No. 51. Jacob [10]. 21 Sagittarii. MAG. 4.9
18h 19m 24s — 20° 35′.7.

Comes = 8.5

1846.2	297°.4	1″.8 ±	Jacob	1 n
1851.2	297.6	2.05	,,	2
1853.7	292.7	2.45	Dawes	2
1873.3	292.6	2.11	Dembowski	5
1877.4	292.6	2.06	Cinc.	1
1878.7	294.0	1.95	Schiaparelli	5
1879.1	292.7	1.91	Cinc.	3
1880.6	295.4	2.15	,,	1–2
1891.7	291.0	2.08	Haverford	1
1897.7	288.3	1.82	See	1

Change doubtful.
Also registered as Alvan Clark 10.
C. P. D. mag. = 7.0.
Washburn 144, a 3″ pair of 9th mag. stars, is about 20′ S.f.

No. 52. Alvan Clark 11. Lal. 33,959. 6.5
18h 19m 46s — 1° 38′.0.

7.2 and 7.3

1854.7	178°.1	0″.42 ±	Dawes	2 n
1874.2	173.3	0.35 ±	Dembowski	5
1875.6	172.1	0.33 ±	Schiaparelli	5
1878.9	163.1	0.35 ±	Cinc.	3
1880.6	170.8	0.3 ±	Pritchett	1
1887.6	178.7	0.28	A. Hall	1

A very close pair, but it is doubtful if there has been any change.

No. 53. β 965. B. D.—17°, 5197. 8.5
18h 21m 17s — 17° 23′.1.

Comes = 12.2

1880.6	105°.6	1″.57	β	3 n

Identification not quite certain.

No. 54. Harvard. Lac. 7696. 5.8
18h 21m 20s — 57° 35′.0.

1891	Double	Arequipa	– n

C. P. D. mag. = 7.2.

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No. 55. β 133. Lac. 7722. MAG. 6.8
18h 21m 30s — 26° 41′.6.

7.5 and 7.7, both white

1875.7	265°.3	1″.80	Schiaparelli	4 n
1878.5	262.6	1.76	Cinc.	3
1888.5	264.7	1.80	Haverford	2
1890.5	267.5	2.07	Glasenapp	2
1893.6	260.6	1.38	Sellors	2
1895.5	260.5	2.10	Barnard	1
1897.7	258.7	1.74	See	2

Also noted as double at Cordoba.

No. 56. H. N. 125. Piazzi 18 h. 68. 7.4
18h 22m 47s — 25° 6′.3.

8.0 and 8.3

1878.7	105°.0	3″.10	C. G. A.	3 n
1889.8	99.0	1.62	Hough	1
1897.7	101.8	3.14	See	2

No. 57. h. 5045. Lac. (7715). 7.2
18h 23m 22s — 48° 4′.8.

Comes = 11.0

1836.5	25°.1	6″.±	*h*	1 n
1897.2	25.1	7.99	See	1

No. 58. Melbourne [5]. Lac. 7697. 7.1
18h 24m 5s — 66° 21′.0.

7.3 orange, and 9.1 blue

1873.6	295°.2	5″.02	Russell	1 n
1879.2	291.9	4.00	,,	2
1881.5	296.0	4.96	,,	2
1891.6	290.2	3.80	Sellors	1

Found at Melbourne in 1869.

Also noted at Cordoba, and measured at Sydney as Russell 308.

No. 59. Triple. Piazzi 18 h. 79. MAG. 5.5
18h 24m 32s — 33° 3′.3.

A = 6.3 B = 6.3 C = 11.3

A and B = λ 353.

1897.7	265°.±	0″.18 ±	See	1 n

A + B and C = Howe

1877.5	207°.6	2″.28	Cinc.	1 n
1889.4	198.6	3.17	β	3
1892.6	201.0	.....	Haverford	1
1897.7	197.9	3.70	See	2

The p.m. of the chief star is about 0″.07 towards 180°.

Howe's *comes* is also registered as β 1128, and the chief star is to be found in the list of new pairs found at Arequipa in 1891 as a double star (only).

Prof. See also measures a star at 29″.

No. 60. Hough 435. B. D.—14°, 5096. 9.8
18h 26m 29s — 14° 4′.5.

Both = 10.6

1893.6	41°.7	0″.89	Hough	3 n

There are several faint stars within 30″.

An 8.5 mag. star is 12 secs. pr.

No. 61. Dunlop 222. κ Coronæ Australis. 5.7
18h 26m 29s — 38° 47′.9.

6.3 and 6.7

1836.6	359°.3	21″.8	*h*	3 n
1856.7	358.9	21.5	Jacob	3
1887.1	359.2	21.7	Tebbutt	3
1890.5	358.8	21.2	Glasenapp	2
1896.6	357.0	21.7	Scott	1

No. 62. β 966. 1st Munich 16,525. 9.6
18h 26m 32s — 19° 3′.0.

10.1 and 10.6

1880.6	120°.2	0″.62	β	3 n

Piazzi 18 h. 95, mag. 8.0, is 66″ N.f.

In Messier 25.

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No. 63. β 419. Lal. 34,259. MAG. 7.9
18h 26m 47s — 7° 53′.9.

8.1 and 9.8

1876.0	40°. ±	1″.5 ±	β	1 n
1877.0	57.7	1.22	Dembowski	3
1888.5	56.6	1.32	Haverford	2

No. 64. Ormond Stone. Lac. 7763. 7.1
18h 27m 48s — 34° 53′.5.

7.6 and 8.3

1876.6	139°.7	1″.78	Cinc.	1 n
1877.6	139.8	2.01	,,	2
1896.7	136.9	1.73	See	2

Also noted as double at Cordoba in 1875, when both stars were observed on the meridian.

No. 65. Hough 567. Lal. 34,399. 7.3
18h 30m 44s — 20° 23′.7.

Comes = 10.4

1895.6	160°.1	1″.19	Hough	2–1 n

Ö. A. 18,445, mag. 9.0, is closely S.f.

No. 66. Hough 436. Lac. 7804. 8.0
18h 32m 5s — 25° 30′.4.

Comes = 11.1

1889.7	177°.1	4″.15	Hough	1 n
1895.6	175.7	4.52	,,	1

The f. star of a triangle.

No. 67. β 135. Lal. 34,476. 7.0
18h 32m 24s — 14° 5′.4.

Comes = 11.8

1875.1	184°.0	2″.45	Dembowski	4 n
1878.5	187.0	1.9 ±	Cinc.	1
1879.6	183.9	[1.45]	β	1
1882.5	187.3	2.49	Cinc.	1
1886.4	185.8	.....	L. McC.	1
1892.5	187.1	.....	Haverford	1
1893.5	187.6	2.24	Leavenworth	2

Discovered with a 6-inch refractor.

No. 68. Σ 2347. Lal. 34,516. MAG. 8.2
18h 32m 48s — 0° 28′.4.

8.4 and 9.8

1829.8	259°.3	3″.17	Σ	5 n
1866.3	257.9	3.29	Dembowski	3
1878.6	256.8	3.20	Cinc.	3
1886.5	258.6	3.18	L. McC.	2
1891.6	258.2	3.02	Glasenapp	5–4

S.f. *e* Serpentis, mag. 5.8.

No. 69. Innes 250. Lac. 7807. 7.5
18h 34m 6s — 42° 15′.5.

7.9 and 8.9

1897.7	130°. ±	0″.9 ±	Innes	1 n

The brightest star of a group N.f. Lac. 7790, mag. 5.1, yellow.

No. 70. Russell 309. Bris. 6455. 8.0
18h 34m 15s — 55° 58′.9.

8.5 and 9.2

1871.5	216°.9	3″.21	Russell	1 n
1886.6	218.7	3.41	Pollock	1
1890.7	217.5	2.59	Sellors	3

Separately observed on the meridian at Cordoba.

Mr Russell's measure is also set down against *h* 5053, a star too wide for inclusion here. It is Lac. 7799, mag. 7.2, and is somewhat N.f. the above pair. *h* 5053, in its turn, seems to have been measured as Russell 310 in 1871.

No. 71. β 967. 1st Munich 17,004. 8.3 Red
18h 35m 14s — 14° 35′.6.

Comes = 11.5

1880.5	195°.8	2″.44	β	4 n
1888.5	196.9	2.4 ±	Haverford	1
1893.5	191.1	2.33	Leavenworth	3

No. 72. Harvard. λ Coronæ Australis. 5.2
18h 36m 55s — 38° 25′.2.

1891.	Double	Arequipa	–n

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No. 73. Washburn 145. Ö.A. 18,579. MAG. 8.9
18h 37m 2s — 15° 29′.1.

9.5 and 9.8

1888.8	58°.9	1″.07	Washburn	3 n

No. 74. h. 5057. C. P. D.—54°, 9055. 9.2
18h 37m 23s — 54° 1′.8.

Both = 10.0

1836.5	75°.7	8″.±	*h*	1 n
1881.8	130.9	2.30	Hargrave	1

The change seems considerable for so faint a pair; it is due, probably, to p.m.

C. Z. 18 h. 2002, mag. 9.2, is 42 secs. pr.; it is called "dpl. I." by Gould.

No. 75. Russell 314. Lac. 7771. 6.2
18h 37m 25s — 73° 6′.0.

6.4 and 8.4

1880.8	260°.3	1″.02	Russell	1 n
1890.8	265.6	1.78	Sellors	2
1891.7	260.0	1.40	,,	1

The p.m. of the chief star is 0″.04 towards 284°.3.

Registered as a new pair at Arequipa. See *Harvard Circular*, No. 18.

No. 76. λ 357. Ö.A. 18,594. 8.3
18h 38m 0s — 29° 31′.7.

A = 8.4 B = 11.6 C = 11.4

A and B

1896.7	174°.2	2″.30	See	1 n

A and C

1896.7	290°.9	13″.20	See	2 n

λ 356, a faint 4″ pair is S. pr.

No. 77. Ormond Stone. 1st Munich 17,168. 8.3
18h 38m 2s — 19° 59′.6.

9.0 and 9.1

1877.7	285°.2*	1″.69	Cinc.	1 n
1886.7	283.7	2.03	L. McC.	1
1891.7	287.0*	1.78	Haverford	2
1897.7	285.5	1.93	See	1

No. 78. λ 358. Ö.A. 18,606. MAG. 7.8
18h 38m 33s —25° 53′.7.

8.2 and 9.1

1897.7	29°.9	1″.62	Lowell	2 n

No. 79. λ 359. Bris. 6479. 7.7
18h 39m 34s — 43° 53′.4.

8.2 and 8.7

1897.4	16°.9	0″.58	See	1 n

No. 80. β 1254. W.B. 18 h. 935. 7.8
18h 39m 59s — 13° 46′.4.

Comes = 10.6

1889.7	74°.5	2″.43	Hough	2 n
1891.5	78.2	2.67	β	6
1897.6	73.7	2.35	Aitken	3

Registered as Hough 438.

Discovered by β in 1875.

No. 81. Lalande 145. Lal. 34,784. 7.0
18h 40m 19s — 10° 35′.8.

7.4 and 8.4

1832.4	339°.1	4″.20	Σ	4 n
1848.6	338.0	4.56	Mitchel	1
1879.3	336.3	4.12	Cinc.	2
1890.9	338.2	3.93	Glasenapp	6

Distance decreasing?

Also registered as Σ 2373.

No. 82. ♅ III. 33. 5 Aquilae. 5.8
18h 41m 19s — 1° 4′.0.

6.0 and 7.7

1796.6	121°.5	11″.2	♅	1 n
1848.6	120.4	12.9	Mitchel	1
1877.7	121.2	13.4	Cinc.	2
1890.9	120.7	13.0	Glasenapp	6
1898.5	119.1	12.9	Solá	2

Fixed.

The p.m. of 5 Aquilae is small.

There is another *comes* 27½″ distant.

Also recorded as Σ 2379 and ♅ N. 9.

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No. 83. Innes 251. Lac. 7868. MAG. 7.7
18h 43m 7s — 33° 42′.5.

Both = 8.5

1897.6	227.°1	1.″13	See	1 n

The pr. star of a right-angled triangle.
This is λ 361 by priority of discovery.

No. 84. Hough 439. Lal. 34,936. 8.0
18h 43m 42s — 11° 5′.2.

Comes = 11.7

1891.7	152.°7	2.″71	Hough	2 n

No. 85. Washburn 147. Ö A. 18,713. 8.1
18h 43m 49s — 17° 1′.1.

8.3 and 10.0

1888.7	295.°6	1.″81	Washburn	3-2 n

No. 86. h. 5066. Lac. 7869. 6.7
18h 43m 57s — 41° 10′.6.

Comes = 9.0

1835.5	89.°1	10.″ ±	*h*	2 n
1881.7	86.5	9.3	Hargrave	1
1896.6	83.8	10.1	See	2

The stars were separately observed on the meridian at Cordoba in 1874.

No. 87. h. 5067. C. P. D.—51°, 11,043. 8.8
18h 45m 2s — 51° 3′.8.

9.2 and 10.0

1835.2	275.°7	1.″8 ±	*h*	3 n
1880.8	276.4	2.43	Hargrave	1

An 11th mag. star f.

No. 88. β 970. B.D.—8°, 4729. 8.8
18h 45m 20s — 8° 6′.3.

9.0 and 10.7

1880.6	107.°3	1.″43	β	4 n
1892.4	107.9	1.54	,,	1

S.f. β 969, a red star of the 7.1 mag., with an 11.8 mag. *comes* at 14″.

No. 89. Innes 112. Lac. 7889. MAG 6.7
18h 46m 33s — 47° 23′.7.

6.8 and 10.0

1896.5	S.	2.″ ±	Innes	3 n

A very pretty pair.
Lac. 7891, mag. 7.1, is closely N.f.

No. 90. h. 5069. Bris. 6512. 7.5
18h 47m 12s — 61° 56′.7.

8.2 and 8.4

1836.7	81.°9	0.″8 ±	*h*	1 n
1871.6	88. ±	0.5 ±	Russell	1
1878.7	100.0	0.95	Melbourne	1
1881.7	88.1	0.65	Hargrave	1
1897.0	92. ±	.....	Innes	1

There is a distant 11th mag. companion in the same direction.

No. 91. Gilliss 248. C. Z. 18 h. 2545. 8.0
18h 48m 18s — 66° 2′.0.

8.4 and 9.4

1890.7	128.°3	4.″32	Sellors	1 n

No. 92. β 1033. ν_2 Sagittarii. 5.2
18h 49m 4s — 22° 47′.8.

Comes = 10.7

1888.7	104.°0	1.″37	β	1 n
1897.6	99.5	2.36	See	2

C. P. D. mag. = 6.6.
The p.m. is small.
ν_1 Sagittarii S.pr. has a distant companion observed as *h* 5073.
Prof. See remarks that β 1033 is really = ν_1 Sagittarii, β having misidentified the pair.

No. 93. λ 364. Lal. 35,172. 7.5
18h 49m 42s — 28° 15′.4.

7.9 and 8.8

1897.6	96.°4	0.″41	See	1 n

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No. 94. h. 2845. Lal. 35,207. MAG. 8.4
18h 50m 5s — 17° 42′.5.

8.6 and 10.1

1831. ±	4.°0	4.″ ±	*h*	1 n
1878.6	5.0	3.84	Cinc.	3
1886.6	5.9	5.13	L. McC.	1

Two unimportant pairs, *h* 2843 and *h* 2844, are a little way pr.

No. 95. β 972. Schj. 7042. 8.8
18h 51m 1s — 0° 41′.8.

9.3 and 10.0

1880.4	4.°7	1.″09	β	5 n
1892.7	5.3	.....	Hough	1
1893.5	5.4	0.94	Goodsell	2

A third star = 9.3 mag. is 74″ away.

No. 96. Innes 113. Bris. 6535. 6.9
18h 51m 18s — 48° 38′.4.

Comes = 11.0

1896.5	225.° ±	3.″ ±	Innes	2 n

No. 97. Brisbane. Lac. 7947. 6.4
18h 54m 18s — 37° 12′.0.

7.1 and 7.2

1837.7	282.°5	13.″0	*h*	1 n
1853.7	282.0	.....	Powell	3
1856.7	282.3	12.5	Jacob	3–2
1888.7	281.9	12.7	Tebbutt	3
1890.5	282.6	11.6	Glasenapp	2

Separately observed on the meridian at the Cape and Cordoba.

No. 98. Cordoba [52]. Moesta 1842. 8.0
18h 54m 26s — 44° 14′.9.

Both = 8.8

1896.7	163.°0	2.″91	Sellors	3 n

Both were observed on the meridian at Cordoba in 1879.

No. 99. h. 5075. Lac. 7924. MAG. 6.9
18h 54m 35s — 63° 55′.6.

7.6 and 7.7

1835.5	108.°6	1.″86	*h*	2 n
1856.6	110.3	1.82	Jacob	3–2
1871.6	110.1	2.05	Russell	1
1880.2	107.9	1.59	Hargrave	2
1886.6	111.4	2.13	Tebbutt	3
1890.6	113.1	1.25	Sellors	1
1893.6	110.5	1.21	„	1

1871. "Looks like oval nebula, with two star points," Russell.
1879. "Blurred," Hargrave.
1885. "Hazy," Tebbutt.
1887. "Haziness not now seen," Tebbutt.
1896. "No nebulosity seen," Innes.

See also the note to Russell (311) in the *Mem. R. A. S.*, vol. xlvii. p. 165, which seems to be an observation of this pair when the magnitudes were estimated as 6 and 11.

No. 100. Innes 252. Cor. D.M.— 34°, 13,321. 7.7
18h 54m 51s — 34° 38′.5.

8.3 and 8.6

1897.7	10.° ±	1.″2 ±	Innes	2 n

See also No. 109.

No. 101. Cordoba [53]. Lac. 7952. 7.5
18h 55m 3s — 40° 48′.2.

7.6 and 9.8

1880.7	178.°2	3.″60	C. G. A.	1 n

No. 102. Pollock [7]. C. Z. 18 h. 2894. 8.5
18h 55m 35s — 42° 24′.6.

9.2 and 9.4

1886.7	180.°5*	2.″01	Pollock	1 n
1889.6	181.1	2.19	„	2
1897.8	179.1	2.34	See	1

This star was noted as double by Mr A. Cochrane at the Cape Transit Circle, and is very probably the star observed by Mr Pollock at Sydney, who, however, identifies it as C. Z. 18 h. 2928.

Also registered as λ 366.

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No. 103. Triple. Lac. 7954. MAG. 7.1
18h 55m 45s — 45° 51′.2.

A = 8.2 B = 8.8 C = 8.3

A and B = Hargrave [317]

	°	″		
1881.7	287.3	1.00	Hargrave	1 n
1886.6	275.3	1.80	Pollock	1
1889.6	278.9	1.47	,,	1

A (+ B) and C = *h* 5078

	°	″		
1834.5	315.1	15. ±	*h*	1 n
1875.7	211.6	19.1	C. G. A.	3
1881.7	212.8	18.5	Hargrave	1
1886.6	212.3	18.9	Pollock	1

h's angle looks like a misprint for 215°.1.

No. 104. h. 5080. Lac. 7960. 7.5
18h 56m 1s — 36° 14′.3.

7.8 and 9.0

	°	″		
1834.5	249.2	5. ±	*h*	1 n
1877.7	246.3	4.89	Cinc.	1
1879.7	248.2	4.88	Hargrave	1
1890.5	247.4	6.47	Glasenapp	2

Separately observed on the meridian at Cordoba.

No. 105. Harvard. Lac. 7949. 6.0
18h 56m 10s — 51° 9′.4.

1891	Triple	Arequipa	- n

No. 106. Washburn 33. Moesta 1850. 7.6
18h 56m 14s — 28° 47′.0.

8.1 and 8.6

	°	″		
1881.5	59.1	2.42	Washburn	3 n
1886.7	60.2	2.62	L. McC.	1
1888.6	60.6	2.60	Washburn	3
1897.6	57.9	2.74	See	1

Moesta 1848, mag. 8.1, is 18 secs. pr., and was marked as Class I. at Cordoba in 1874; but this pair is, no doubt, the one there referred to.

Both components of Moesta 1850 were observed on the meridian at Cordoba in 1880.

No. 107. Harvard 150. ζ Sagittarii. MAG. 2.7
18h 56m 15s — 30° 1′.4.

3.4 and 3.6

	°	″		
1867.60	264.6	0.68	Harvard	4–2 n
1867.78	260.8	0.48	Newcomb	2–1
1878.70	84.2	0.42	*β*	1
1880.62	62.1	0.55	,,	2
1881.61	36.1	0.31	,,	2
1886.62	271.3	0.65	Hall	4
1887.64	265.3	.....	Pollock	5
1889.41	255.1	0.81	*β*	5
1891.57	253.7	0.57	Haverford	1
1892.39	245.1	0.60	*β*	3
1895.62	193.6	0.13	Barnard	2
1897.72	109.3	0.25	Lowell	6

Other measures.

A particularly interesting short period binary with a common p.m. of 0″.051 towards 278°.9.

Discovered by Prof. Winlock at the Harvard Observatory in 1867, and, curiously enough, registered there again as a new pair in 1897 after two revolutions had been practically accomplished. See *Harvard Circular*, No. 18.

The latest orbit is by Prof. See. He finds:—

P = 18.85 years	*ι* = 67°.32
T = 1878.8	☊ = 69°.3
a = 0″.69	λ = 328°.1
e = 0.279	

Motion retrograde.

There are two apparent minima and maxima in distance, viz.:—

0″.19
0 .23

and

0″.49
0 .82

As a wide pair, this is the chief star of ☿H. V. 78.

See:—

1880. Burnham, S.W., "Measures," *Astr. Nachr.*, No. 2338.

No. 108. h. 5082. Lal. 35,497. 5.9
18h 57m 11s — 19° 23′.3.

Comes = 8.5

	°	″		
1836.6	91.0	6. ±	*h*	1 n
1878.6	88.6	7.37	Cinc.	2
1890.5	88.3	6.98	Glasenapp	2
1897.7	89.2	7.35	See	1

C. P. D. mag. = 7.3.

h also noted a 9.8 mag. star 20″ S.f.

Lal. 35,499, mag. 7.0, is 9′ N.f.

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No. 109. λ 367. C. Z. 18 h. 2979. MAG. 8.0
18h 57m 29s — 34° 31′.0.

8.4 and 9.4

	°	″		
1897.7	9.6	0.80	See	1 n

A 10th mag. star is 4 secs. f.
See also No. 100.

No. 110. Σ 2434. Piazzi 18 h. 274. 8.5
18h 57m 36s — 0° 51′.1.

8.8 and 10.0

	°	″		
1831.6	80.5	1.93	Σ	3
1848.1	72.3	1.54	Mitchel	2
1864.7	69.6	1.79	Dembowski	2
1868.5	68.9	1.80	,,	2
1877.7	63.3	1.58	Cinc.	2–1
1878.6	64.1	1.53	β	1
1880.6	64.9	1.46	,,	3
1886.4	61.8	1.32	L. McC.	1
1896.5	59.4	1.32	Leavenworth	3
1896.5	53.8	1.12	Lick	3

Piazzi 18h. 275, mag. 8.5, is S.f., and has been measured on several occasions; some are :—

	°	″		
1823.5	148.8	26.02	S. and *h*	2 n
1831.6	147.0	25.56	Σ	4
1848.6	141.3	25.77	Mitchel	1
1880.6	131·8	23.84	β	1
1896.5	126.3	23.59	Lick	3
1898.5	126.1	22.77	Solá	1

The close pair is a binary system; the change in the more distant star is due to the difference of p.m., viz. :—

	α	δ
Piazzi 18 h. 274	—0s.004	—0″.20
,, ,, 275	—0.000	—0.08

No. 111. H. N. 129. Lac. 7983. 7.8
18h 58m 12s — 23° 2′.6.

8.0 and 9.5

	°	″		
1867.6	305.8	8.11	Harvard	1
1890.5	307.4	7.47	Glasenapp	2
1896.6	307.7	8.14	Aitken	1

Noted as double by Argelander, and also registered as Harvard 151.
Other measures.

No. 112. H. N. 126. Lal. 35,540. MAG. 7.0
18h 58m 21s — 21° 40′.6.

7.7 and 7.8

	°	″		
1873.	40. ±	0.7 ±	β	1 n
1879.53	22.4	0.83	Cinc.	2
1890.48	353.2	0.58	β	3
1891.51	349.3	0.48	,,	3
1895.61	331.6	0.35	Barnard	6
1896.73	317.5	0.44	Aitken	2
1897.75	310.7	0.56	See	1

Common p.m. of 0″.114 towards 150°.9.
The credit of having revived this very evident binary belongs to β, as it had not been observed by anyone since its discovery by H.
H gave no particulars except "Class I."
No other measures found.

No. 113. h. 5084. γ Coronae Australis. 4.3
18h 59m 40s — 37° 12′.4.

Both = 5.1

	°	″		
1834.5	37.1	3. ±	*h*	1 n
1836.4	34.5	3.67	,,	1
1847.3	14.1	2.30	Jacob	1
1852.5	2.4*	1.91	Maclear	2
1854.1	356.6	1.80	Jacob	2
1858.2	343.4	1.53	,,	3
1863.8	318.1	.....	Powell	4
1871.2	281.9	.....	,,	1
1875.6	257.4	1.45	Schiaparelli	4
1876.7	.....	1.29	Melbourne	2
1877.7	248.0*	1.31	,,	3
1878.8	240.7*	2.00	,,	2–1
1886.6	200.3	1.37	Pollock	6
1891.7	176.7	1.54	Tebbutt	9–4
1895.7	161.9	1.59	See	1–2
1896.6	157.3	1.70	Scott	5
1897.5	156.8	1.95	Lehman	2
1897.6	151.6	1.37	Aitken	3
1897.8	140.7	2.04	See	1

Some of the above measures have not been published before. More complete lists of measures will be found in the *M. N. R. A. S.*, vol. lii. p. 503 (Gore), and in *Evolution of Stellar Systems*, pp. 226–7 (See).

[contd.

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This well-known binary system has a common p.m. of 0″.312 towards 164°.4.

Many orbits have been computed; the latest is by Prof. See, who finds:—

$P = 152.7$ years
$T = 1876.8$
$a = 2''.45$
$e = 0.42$
$\iota = 34°.0$
$\Omega = 72°.3$
$\lambda = 180°.2$

Motion retrograde.

The distance will increase slowly until 1953, when the maximum of about 3″.5 will be attained.

C. P. D. mag. = 5.5.

No. 114. Cordoba [54]. Cape 1880, 10,375. MAG. 8.3

$18^h\ 59^m\ 43^s$ — 38° 16′.7.

8.5 and 10.0

1880.7	185°.4	5″.01	C. G. A.	2 n
1896.7	197.4	5.09	See	3

No. 115. β 974. Schj. 7133. 8.8

$18^h\ 59^m\ 57^s$ — 6° 19′.5.

9.4 and 9.7

1880.6	87°.8	0″.72	β	3 n
1891.4	84.4	0.96	„	2

There is a 12th mag. star 25″ distant.

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No. 1. South 710. Lal. 35,693. MAG. 5.8
19h 1m 7s — 16° 22′.9.

Comes = 8.9

1877.6	1.°7	6.″27	Cinc.	3 n
1888.6	0.7	6.26	Haverford	1

Separately observed on the meridian at Cordoba in 1878.

No. 2. Hough 441. B.D.—12°, 5283. 9.5
19h 1m 40s — 12° 51′.5.

Both = 10.3

1888.6	200.°7	1.″31	Hough	2 n

Hough 96, mag. 9.4, 38 secs. f. and 5′ S., is a faint 3″ pair (= B.D.–12°, 5288) with a 9.6 mag. star S.f.

No. 3. h. 5085. Lac. 7977. 7.5
19h 1m 48s — 60° 12′.2.

7.7 and 9.2

1835.6	239.°9	2.″3 ±	*h*	3 n
1857.8	250.6	2.7 ±	Jacob	3
1872.6	239.4	3.30	Russell	1
1880.6	247.9	3.51	Cruls	1
1886.6	240.9	3.06	Pollock	2

Jacob's observations, although fairly consistent, were taken under bad conditions.

Both stars have been observed on the meridian at Cordoba.

Closely S.pr. the fine cluster, Lac. 7980.

No. 4. λ 370. C. Z. 19 h. 18. 8.9
19h 2m 4s — 35° 34′.7.

Comes = 10.9

1896.8	91.°3	1.″88	See	1 n

Prof. See also measures stars at 7″ and 12″.

No. 5. Gale. Lac. 7997. 5.6
19h 7m 9s — 66° 50′.0.

5.8 and 7.8

1895.1	40.° ±	0.″5 ±	Gale	3 n
1896.8	45. ±	0.7 ±	Innes	1

Common p.m. of 0″.026 towards 293°.0.

This is in the list of stars discovered at Arequipa in 1891 (see *Harvard Circular*, No. 18), and was discovered independently at Sydney in 1895. Publication in both cases was in 1897; the discovery by Mr Gale was communicated to several astronomers in 1895.

No. 6. β 138. Lal. 36,013. MAG. 7.8
19h 7m 45s — 14° 36′.9.

8.0 and 10.3

1875.1	278.°3	1.″54	Dembowski	4 n
1879.1	280.9	1.14	Cinc.	2
1892.6	280.5	0.79	Hough	1

No. 7. Harvard 152. Yarnall, 8354. 8.2
19h 8m 8s — 29° 26′.5.

8.4 and 10.4

1867.6	263.°6	1.″ ±	Harvard	1 n
1896.8	264.8	0.59	See	2
1897.7	265. ±	1.5 ±	Innes	2

Prof. See's distance seems somewhat small.

Lac. 8043, mag. 7.6, is 13 secs. f. 2′ N.

No. 8. Cordoba [55]. Ö 9,272. 8.5
19h 8m 26s — 27° 29′.5.

9.1 and 9.4

1879.7	322.°6	4.″16	C. G. A.	1 n
1897.7	328.3	1.99	See	1

Two degrees N.f. are two wide faint pairs, one noted by Prof. Howe, the other = *h* 5101 = Ö.A. 19,310.

No. 9. Innes 114. Bris. (6605). 7.8
19h 10m 32s — 63° 4′.5.

8.2 and 9.0

1896.6	280.° ±	0.″7 ±	Innes	1 n

An 8.5 star is 27 secs. pr.

No. 10. h. 596. Lal. 36,205. 6.8
19h 11m 56s — 16° 8′.7.

7.3 and 7.8

1830.0	14.°5	9.″18	South and *h*	–n
1880.8	15.0	8.29	Cinc.	4
1888.5	14.1	8.14	Haverford	1

Also recorded as South 715 in *h*'s General Catalogue of 10,300 double stars.

Other measures.

Both pr. and f. will be found wide pairs, one noted by Prof. Howe, the other = *h* 1381.

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No. 11. Innes 253. Lac. (8066). MAG. 7.5
19h 12m 29s — 33° 27′.3.

8.2 and 8.3, both yellow

1897.7	135°.5	0″.43	See	2 n

Found independently by Prof. See = λ 392.
The brightest star of a triangle.

No. 12. Σ 2490. W.B. 19 h. 235. 9.0
19h 12m 45s — 3° 39′.2.

9.3 and 10.6

1828.1	249°.2	3″.24	Σ	3 n
1848.6	245.6	3.30	Mitchel	1
1886.6	247.3	3.52	L. McC.	2
1891.7	247.4	3.25	Haverford	1

Also registered as Hough 103.

No. 13. Dunlop 226. β_1 Sagittarii. 4.1
19h 15m 27s — 44° 38′.8.

Comes = 7.2

1835.0	78°.6	29″.1	*h*	3 n
1855.8	78.3	.....	Powell	1
1877.7	78.0	28.0	Cape M. O.	3
1892.5	76.7	27.8	Scott	1
1897.8	76.8	28.5	See	1

The change shown arises from the p.m. of the chief star, viz. :—0″.038 towards 238°.0.

One measure of this pair will be found in the Sydney lists, but it is there credited to *h* 5107, a star some 11° distant.

No. 14. h. 5103. Gilliss P. Z. 13,844. 8.8
19h 15m 31s — 71° 58′.2.

Comes = 12.5

1835.6	240°.8	7″.±	*h*	1 n
1872.0	Not seen		Russell	2

No. 15. Washburn 149. B.D. —18°, 5331. 9.0
19h 16m 26s — 18° 35′.2.

9.7 and 9.8

1888.8	184°.7	1″.29	Washburn	3 n

Identified at the Washburn Observatory as B.D. – 18°, 5330, but the position given is that of the star above.

No. 16. Innes 115. Melbourne I. 983. MAG. 8.0
19h 16m 37s — 62° 22′.5.

Comes = 11.0

1896.6	315°.±	3″.±	Innes	1 n

No. 17. Innes 116. C. Z. 19 h. 647. 8.4
19h 16m 43s — 46° 8′.0.

8.7 and 10.0

1896.8	170°.±	1″.7 ±	Innes	1 n

C. Z. 19 h. 648, mag. 8.6, is 17″ S.

No. 18. Howe. Ö.A. 19,458. 8.5
19h 17m 6s — 18° 10′.8.

9.2 and 9.3

1877.7	83°.3	2″.17	Cinc.	1 n
1880.5	81.8	2.56	,,	2
1886.7	81.5	2.46	L. McC.	2

No. 19. Σ 2503. B.D.—7°, 4938. 8.7
19h 17m 20s — 7° 19′.2.

9.1 and 10.1

1829.4	280°.2	2″.55	Σ	3 n
1848.6	279.9	2.23	Mitchel	1
1866.6	282.8	2.32	Harvard	1
1872.7	281.1	2.49	Dembowski	1

No. 20. Washburn 35. B.D.—18°, 5342. 9.0
19h 18m 2s — 18° 41′.2.

9.7 and 9.9

1881.6	191°.2	1″.40	Washburn	3 n
1888.7	190.0	1.63	,,	6

Also registered as Washburn 151, or, at least, both have been identified there as B.D. – 18°, 5342.

No. 21. Ormond Stone. Cor. D.M. —32°, 15,154. 8.0
19h 18m 40s — 32° 25′.7.

8.4 and 9.4

1877.6	292°.3	1″.74	Cinc.	1 n
1897.7	296.7	1.73	See	1

Identified as C. Z. 19 h. 895, mag. 9.0, by Prof. See, and registered as a new pair = λ 377. R.A. = 19h 22m 14s Dec. – 32° 30′.5.

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No. 22. h. 5113. Lac. 8098. MAG. 6.1
19h 18m 46s — 29° 30′.1.

Comes = 9.2

1837.5	121°.9	25″.±	*h*	1 n
1867.6	172.4	17.7	Harvard	1
1877.7	170.2	16.6	Cinc.	1
1879.6	170.1	16.8	,,	1
1897.7	168.7	16.0	See	1

h's angle seems irreconcilable. (171°.9?)
Other measures.
C. P. D. combined mag. = 7.7.

No. 23. λ 373. C. Z. 19 h. 766. 9.0
19h 19m 18s — 42° 5′.1.

9.3 and 10.6

1897.8	28°.6	1″.15	See	1 n

No. 24. h. 5114. Lac. 8091. 5.4 Yellow
19h 19m 46s — 54° 31′.5.

Comes = 10.0

1837.7	130°.9	1″.7 ±	*h*	1 n
1856.6	248.6	1.3 ±	Jacob	3
1857.8	260.0	1.5 ±	,,	3
1880.5	Impossible dédoubler		Cruls	1
1897.7	Not seen		Innes	2

A short period binary pair, in all probability, but it has been neglected for some forty years.
The p.m. of the chief star is 0″.081 towards 284°.3.
Preceded by C. Z. 19 h. 774, mag. 8.1, which has been measured as follows:—

h 5114 and C. Z. 19 h. 774.

1837.7	270°.6	69″.4	*h*	1 n
1857.2	266.0	66.4	Jacob	4–1
1873.7	262.5	67.8	Russell	1
1880.5	260.0	65.9	Cruls	1

Mr Russell makes no mention of the nearer companion, which was then, as now, doubtless, too close to be seen; he measured a faint star 71″ f.

No. 25. ° λ 376. C. Z. 19 h. 848. 8.6
19h 21m 10s — 31° 34′.9.

9.3 and 9.5

1897.7	116°.9	0″.70	See	1 n

No. 26. h. 5117. Lac. 8105. MAG. 7.5
19h 21m 15s — 44° 5′.0.

7.8 and 9.0

1836.6	265°.1	6″.03	*h*	3 n
1851.5	265.0	6.32	Jacob	4–3
1857.8	265.6	6.07	,,	2
1879.7	265.3	5.61	Hargrave	1
1890.7	261.8	6.11	Sellors	1

Both stars have been observed on the meridian at Cordoba.

No. 27. β 423. Ö.A. 19,560. 8.0
19h 21m 33s — 29° 42′.0.

8.4 and 9.2

1877.6	125°.0	1″.25	Cinc.	1
1879.7	119.6	1.19	,,	1
1886.8	124.3	1.27	L. McC.	1
1893.7	125.4	1.09	Sellors	2
1897.7	124.9	1.31	See	1

No. 28. Schjellerup, 30. Lal. 36,712. 7.3
19h 22m 37s — 12° 20′.7.

8.0 and 8.1

1874.1	317°.7	1″.38	Dembowski	5–4 n
1878.9	319.6	1.37	Cinc.	2
1879.2	319.5	1.58	Schiaparelli	4
1882.5	324.4	1.68	Cinc.	2
1886.5	327.6	1.68	L. McC.	1
1888.5	328.3	1.60	Haverford	3
1893.5	330.8	1.53	Goodsell	3
1896.5	333.8	1.56	Leavenworth	2

The angle is increasing.
Also registered as β 142.

No. 29. Hough 106. W.B. 19 h. 494. 8.3
19h 22m 56s — 3° 15′.1.

Comes = 10.3

1883.8	214°.5	1″.08	Hough	2 n

e Aquilæ mag. 5.2, is N.f.

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No. 30. Innes 254. C. Z. 19 h. 916. MAG. 8.0
19h 23m 4s — 48° 38′.5.

8.7 and 8.8

1897.8	225°. ±	1″.5 ±	Innes	1 n

The N.f. and brightest of three stars in the finder.

No. 31. h. 5120. Ö.A. 19,598. 8.3
19h 23m 6s — 29° 54′.7.

8.6 and 9.7

1834.6	171°.9	2″. ±	*h*	1 n
1877.7	173.7	3.86	Cinc.	1
1897.7	169.1	4.42	See	1

No. 32. Innes 117. Lac. 8102. 6.9
19h 23m 26s — 60° 28′.6.

7.3 and 8.3

1896.7	180°. ±	1″. ±	Innes	1 n

No. 33. ♅. N. 119. Mayer 808. 5.6
19h 23m 41s — 27° 11′.4.

Comes = 8.7

1798.7	S.f.	Class I.	♅	1 n
1877.6	140°.2	8″.17	Cinc.	3

C. P. D. mag. = 6.8.
The chief star has a p.m. of 0″.06 towards 180°.
This is perhaps Harvard 153.

No. 34. Innes 118. Lac. 8124. 7.0
19h 25m 32s — 46° 59′.0.

7.1 and 9.4

1896.9	137°. ±	1″. ±	Innes	3 n

No. 35. Innes 255. C. P. D.—48°, 10,191. 8.6
19h 25m 41s — 48° 55′.0.

9.0 and 10.0

1897.8	180° ±	2″. ±	Innes	1 n

A brighter star 1m f., a little N.

No. 36. λ 380. C. Z. 19 h. 1045. MAG. 8.6
19h 25m 53s — 38° 21′.8.

9.0 and 10.0

1896.7	29°.9	6″.90	See	3 n

C. P. D. mag. = 10.2.
The pr. star of a triangle.
There is a fainter pair 14′ N.f. seen at the Cape whilst looking at C. Z. 19 h. 1134, mag. 8.7, which was noted as double Class I., at Cordoba in 1874, but here it was found single. (1 n.)

No. 37. λ 381. Ö.A. 19,662. 9.1
19h 26m 0s — 27° 57′.6.

9.8 and 10.0

1897.7	13°.1	1″.55	See	1 n

No. 38. Dembowski 21. Lal. 36,902. 7.3
19h 26m 4s — 2° 19′.2.

7.8 and 8.5

1865.8	70°.0	1″.22	Dembowski	2 n
1871.7	69.1	1.18	,,	4
1879.6	70.1	1.02	Cinc.	5–4
1880.6	71.0	1.17	*β*	1
1890.7	66.9	1.04	,,	3

A 9.0 mag. star is 27″ N.pr., and with A + B has been measured as Σ 2535.
Lal. 36,894, mag. 7.7, is a little way pr.

No. 39. λ 382. C. Z. 19 h. 1130. 8.0
19h 28m 13s — 41° 38′.1.

8.5 and 9.2

1897.8	293°.1	2″.10	See	1 n

No. 40. λ 384. Piazzi 19 h. 165. 6.0
19h 29m 38s — 23° 31′.7.

Comes = 11.5

1897.7	167°.0	6″.11	See	1 n

C. P. D. mag. = 7.7.

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No. 41. β 654. h_2 Sagittarii. MAG. 4.4
19h 30m 37s — 25° 6′.3.

Comes = 10.5

1878.6	160°.8	2″.93	β	3 n
1878.7	163.2	2.64	Cinc.	1
1889.4	159.1	3.00	β	4
1897.7	164.3	2.89	See	3

The p.m. of the chief star is 0″.033 towards 116°.7.

No. 42. λ 385. Porter 3257. 8.3
19h 31m 8s — 21° 51′.1.

Comes = 14.9

1897.7	6°.9	3″.88	See	1 n

Prof. See also measures an 11th mag. star 28″ N.pr.

No. 43. Σ 2541. Piazzi 19 h. 185. 8.3
19h 31m 17s — 10° 39′.5.

8.5 and 10.0

1831.0	340°.0	2″.84	Σ	3
1848.2	336.3	3.02	Mitchel	2
1851.9	338.4	3.61	W. Σ	2
1867.9	331.5	3.42	Dembowski	4
1880.6	332.4	3.74	Pritchett	3
1886.8	332.8	4.08	Miss Lamb	4

Other measures.

This pair has a common p.m. of 0″.391 towards 227°.3.

Near ℍ I. 13, which has, on several occasions, been confused with the above pair. See No. 47.

No. 44. λ 387. Lac. 8167. 6.7
19h 32m 31s — 45° 30′.3.

7.4 and 7.5

1897.8	358°.7	0″.42	See	1 n

No. 45. λ 388. C. Z. 19 h. 1338. 7.5
19h 32m 53s — 39° 58′.3.

Comes = 10.5

1897.8	177°.0	2″.83	See	1 n

No. 46. β 761. Lac. 8174. MAG. 6.8
19h 33m 7s — 39° 39′.6.

Comes = 9.8

1879.7	197°.4	[1″.92]	β	3–2 n
1886.7	198.7	2.55	Pollock	1
1889.4	198.2	2.45	β	3
1896.6	196.0	2.33	See	3

See also No. 45.

No. 47. ℍ. I. 13. Lal. 37,207. 7.1.
19h 33m 14s — 10° 22′.9.

A = 7.3 B = 9.1 C = 12.0

A and B

1782.8	307°.3	.....	ℍ	2 n
1802.8	314.8	.....	„	1
1825.6	316.1	4.49	South	4
1829.1	315.2	3.52	Σ	5
1846.0	317.1	3.35	Jacob	1
1847.3	319.0	3.16	Mitchel	3
1862.8	317.6	3.68	Knott	2
1877.6	319.0	3.70	Cinc.	2
1880.6	320.9	3.68	„	2
1886.7	316.4	3.62	Hall	3
1890.5	320.9	3.91	Glasenapp	2
1896.6	322.1	3.70	Hussey	1

B and C

1879.6	282°.7	3″.82	Cinc.	1 n
1888.5	282.8	4.21	Haverford	1

C strangely enough was invisible to Σ and others although seen by ℍ with a 6½-inch reflector. There is an interesting note on the subject, by Dawes, in the *Mems. R. A. S.*, vol. xxxv. p. 495.

See also a paper by George Hunt, *M. N. R. A. S.*, vol. xxxii. pp. 90–92.

There is another star of 10th mag. 28″ away.

Also recorded as Σ 2545.

Σ 2547, a wide pair, is 13′ S.f.

No. 48. λ 389. 53 Sagittarii. 6.2
19h 33m 49s — 23° 39′.3.

6.7 and 7.2

1897.7	331°.9	0″.17	See	3–1 n

Common p.m. of about 0″.07.

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No. 49. Innes 119. Lac. 8163. MAG. 7.5
19h 34m 0s — 59° 14′.2.

7.8 and 9.1

1896.7	175.° ±	1.″2 ±	Innes	1 n

No. 50. Russell 319. Anon. 8.6
19h 34m 0s — 73° 11′.0.

9.0 and 10.0

1871.6	54.°4	3.″56	Russell	1 n

See note.

No. 51. Cordoba [56]. Lac. 8173. 7.0
19h 34m 27s — 53° 10′.8.

7.4 and 8.2

1875.7	65.°1	2.″38	C. G. A.	4 n
1886.8	54.9	3.54	Pollock	1
1887.7	48.7	3.46	„	4–2
1891.7	49.4	3. ±	Sellors	2

No. 52. λ 393. Lal. 37,399. 7.8
19h 38m 11s — 27° 52′.8.

Both = 8.6

1897.7	211.°2	0.″18	See	1 n

No. 53. β 827. Lal. 37,470. 8.2
19h 39m 13s — 11° 25′.7.

8.6 and 9.5

1881.6	268.°0	0.″87	β	3 n
1888.0	269.9	0.98	Washburn	3
1891.7	251.8	1.34	Haverford	2

Two 8.5 mag. stars are N.pr.

No. 54. Triple. Lac. 8194. 7.0
19h 40m 14s — 62° 3′.4.

A = 7.5 B = 8.0 C = 9.6

A and B = Innes 120

1896.6	185.° ±	0.″8 ±	Innes	1 n

. . A + B and C = *h* 5141

1836.6	344.°0	15.″ ±	*h*	1 n
1872.7	344.6	13.3	Russell	1
1896.6	340. ±	.....	Innes	1

No. 55. λ 394. Lal. 37,491. MAG. 7.6
19h 40m 22s — 25° 7′.3.

8.1 and 8.6

1897.7	293.°6	0.″37	See	2 n

No. 56. h. 5140. Lac. 8190. 7.3
19h 40m 24s — 65° 9′.4.

8.0 and 8.1

1836.9	89.°6	1.″78	*h*	3 n
1872.6	84.0	2.36	Russell	2
1878.8	84.5	2.39	Melbourne	1
1880.2	84.2	1.64	Hargrave	2
1891.7	84.2	2. ±	Sellors	1

No. 57. β 467. Lal. 37,507. 7.3
19h 40m 35s — 21° 46′.1.

7.4 yellow and 9.9 orange

1879.6	135.°1	2.″64	Cinc.	2 n
1886.7	131.2	3.04	L. McC.	3
1892.5	134.2	3.13	Haverford	1
1897.7	136.7	3.27	See	1

No. 58. β 146. Lal. 37,544. 8.3
19h 41m 16s — 20° 7′.5.

8.7 and 9.6

1879.6	301.°8	0.″91	β	1 n
1879.6	295.8	0.98	Cinc.	1
1891.7	308.4	0.91	β	3
1897.7	305.8	1.09	Aitken	3

In a low power field with f Sagittarii, mag. 5.1.

No. 59. Ormond Stone. Ö.A. 19,956. 8.0
19h 41m 34s — 22° 4′.4.

8.3 and 9.7

1879.6	9.°2	1.″66	Cinc.	2 n
1886.7	9.2	1.71	L. McC.	1
1891.6	3.9	1.62	Haverford	1
1894.7	5.5	1.04	Sellors	2
1897.7	6.0	1.62	See	1–2

Note to No. 50.—Identification has not been made out. There is no star in the C. P. D. in the position given by Mr Russell, and a search here on one night was unsuccessful.

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No. 60. λ 395. O.A. 19,960. MAG. 8.6
19h 42m 12s — 26° 54′.3.

9.3 and 9.5

1897.7	106°.1	2″.01	See	1 n

No. 61. Innes 121. Lac. 8207. 5.5
19h 42m 16s — 59° 26′.6.

5.7 and 7.7

1896.6	80°. ±	0″.7 ±	Innes	1 n

The p.m. is very small.

No. 62. Innes 122. Piazzi 19 h. 266. 7.6
19h 43m 45s — 42° 6′.6.

Comes = 10.5

1896.8	330°. ±	4″. ±	Innes	1 n

No. 63. Σ 2582. W.B. 19 h. 1069. 8.2
19h 44m 35s — 4° 10′.4.

8.5 and 9.8 yellowish

1829.9	264°.8	2″.35	Σ	4–5 n
1866.4	261.0	2.45	Dembowski	3
1886.7	260.9	2.57	L. McC.	1
1890.5	263.1	2.42	Glasenapp	2

Other measures.

No. 64. Dunlop 227. Lac. 8227. 5.3
19h 44m 40s — 55° 13′.5.

5.6 yellow and 6.9 greenish

1835.0	150°.6	23″.1	*h*	3 n
1871.8	147.1	22.7	Russell	1
1875.7	148.9	23.0	Cape M. O.	3

No. 65. β 148. Lal. 37,779. 7.3
19h 46m 32s — 10° 36′.4.

7.9 and 8.3

1875.3	333°.2	0″.91	Dembowski	4–3 n
1879.2	331.2	0.87	Cinc.	3–1
1888.5	326.6	0.79	Haverford	1
1891.6	323.3	0.78	β	2

Slow change.

A third star, 13.5 mag., is 26″ distant.

No. 66. h. 5152. Ö.A. 20,036. MAG. 8.1
19h 47m 9s — 30° 31′.5.

8.6 and 9.1

1835.2	153°.6	3″. ±	*h*	2 n
1877.6	154.9	6.19	Cinc.	2–3

No. 67. h. 2904. Lal. 37,813. 6.4
19h 48m 18s — 24° 11′.4.

6.4 and 9.8

1830.6	173°.5	20″. ±	*h*	1 n
1834.6	170.6	20. ±	,,	1
1878.7	140.8	18.4	β	1
1885.6	133.0	16.3	Wilson	1
1886.6	129.2	16.6	Hall	3

The change is due to the rectilinear motion of the large star. The nearest approach, some 14″, will occur about 1911.

See :—

1886. Wilson, H. C., *Sidereal Messenger*, vol. v. p. 30.

1886. Burnham, S. W., *Sidereal Messenger*, vol. v. p. 56.

1886. Sadler, Herbert, *Sidereal Messenger*, vol. v. p. 93.

No. 68. Washburn 36. 1st Munich 22,205. 8.3
19h 49m 19s — 20° 36′.3.

8.8 and 9.3

1881.7	214°.3	1″.03	Washburn	3 n
1888.6	213.2	1.24	,,	3

No. 69. Σ 2597. Lal. 37,901. 6.3
19h 49m 58s — 6° 59′.7.

6.8 and 7.3 white

1826.5	92°.1	1″.92	Σ	4 n
1848.7	86.4	1.40	Mitchel	1
1880.8	88.6	1.23	β	1
1888.5	89.1	1.46	Haverford	1
1890.1	92.6	1.83	Glasenapp	4–2
1898.5	87.2	1.63	Solá	1

Although virtually stationary this pair has a common p.m. of 0″.124 towards 193°.9.

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No. 70. β 830. Lal. 37,916. MAG. 8.5
19h 50m 2s — 1° 6′.3.

Comes = 11.7

1881.7	106.°4	2.″72	β	2 n
1886.9	105.6	2.90	Miss Lamb	2
1887.8	106.0	2.81	Washburn	3

No. 71. λ 399. Cor. D.M.—36°, 13,788. 8.5
19h 50m 18s — 36° 38′.6.

Comes = 13.2

1896.8	32.°4	4.″40	See	2 n

No. 72. Alvan Clark 12. Lal. 38,059. 7.5
19h 53m 11s — 2° 30′.1.

8.0 and 8.6, both yellow

1854.7	333.°8	0.″86	Dawes	1 n
1859.6	335.0	0.81	Secchi	1
1866.6	332.5	.....	Harvard	3
1873.2	332.4	0.93	Dembowski	4
1878.2	324.9	1.03	Schiaparelli	5–4
1879.0	327.1	1.01	Cinc.	7
1881.1	325.9	1.17	„	3
1886.6	326.4	1.08	L. McC.	2
1888.5	323.7	1.18	Haverford	3
1891.7	324.2	1.32	„	2

Slow change.

An observation by Secchi, 1857.8, is omitted, as it must evidently belong to another pair, or is erroneous.

No. 73. Innes 256. Lac. 8289. 6.9
19h 54m 11s — 47° 40′.3.

7.0 and 9.5

1897.7	160.° ±	0.″8 ±	Innes	1 n

No. 74. λ 400. Ö.A. 20,138. 8.1
19h 54m 21s — 24° 13′.7.

8.3 and 10.4

1897.7	30.°4	1.″38	See	1 n

No. 75. h. 5163. Lac. 8283. MAG. 7.8
19h 56m 13s — 63° 20′.3.

8.2 and 9.0

1836.5	252.°5	1.″4 ±	*h*	2 n
1857.9	250.3	2. ±	Jacob	2
1871.6	247.8	1.57	Russell	1
1873.7	245.8	2.15	„	1
1890.7	249.4	1.49	Sellors	2

Both stars have been observed on the meridian at Cordoba.

No. 76. H. I. 93. Piazzi 19 h. 365. 7.5
19h 56m 31s — 0° 28′.5.

7.9 and 8.6

1793.2	286.°2	″.....	H	2 n
1876.7	293.8	2.11	Dembowski	4

The angle is probably increasing.

No. 77. λ 403. Lac. 8317. 7.2
19h 57m 10s — 36° 20′.4.

A = 7.8 B = 8.1 C = 12.0

A and B

1896.7	116.°9	0.″61	See	3 n

A and C

1896.7	24.°8	7.″58	See	1 n

No. 78. λ 404. Piazzi 19 h. 374. 6.6
19h 59m 9s — 33° 17′.0.

6.8 and 8.8

1897.7	65.°3	0.″49	See	1 n

Prof. See also measures a 13.3 mag. star 22″ S.

No. 79. β 56. Lal. 38,342. 7.3
19h 59m 50s — 4° 35′.6.

7.5 white and 9.3 orange

1875.4	162.°2	1.″61	Dembowski	4 n
1879.3	164.3	1.57	Cinc.	3
1886.7	165.0	1.65	L. McC.	3
1888.6	165.6	1.70	Haverford	1
1892.7	168.2	2.43	Glasenapp	2–1
1896.5	165.7	1.55	Leavenworth	3

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No. 1. Washburn 154. W.B. 19 h. 1440. MAG. 8.7
20h 0m 5s — 14° 37′.3.

Both = 9.5

1888.8	40.°7	1.″28	Washburn	4–3 n

No. 2. λ 405. Ö.A. 20,228. 8.0
20h 0m 30s — 28° 39′.4.

8.6 and 9.0

1897.7	233.°4	0.″48	See	1 n

No. 3. Washburn 155. W.B. 19 h. 1463. 8.8
20h 0m 51s — 13° 39′.3.

9.3 and 9.8

1888.7	275.°7	1.″83	Washburn	3 n

No. 4. λ 406. Lal. 38,398. 7.8
20h 1m 32s — 19° 51′.6.

7.9 and 10.8

1897.8	1.°2	2.″73	See	1 n

No. 5. β 832. 1st Munich 23,011. 8.5
20h 1m 37s — 10° 59′.2.

9.2 and 9.4

1881.7	101.°8	1.″34	β	3 n
1886.9	104.0	1.36	Washburn	2
1888.5	100.2	1.34	Haverford	1

No. 6. λ 407. Yarnall, 8898. 8.5
20h 2m 21s — 39° 0′.8.

9.2 and 9.4

1896.7	261.°4	3.″13	See	3 n

No. 7. h. 5167. Bris. 6800. MAG. 7.3
20h 2m 53s — 63° 54′.6.

7.7 and 8.6

1836.0	35.°7	7.″27	*h*	3–1 n
1873.7	34.6	7.61	Russell	1
1877.7	34.2	7.62	C. G. A.	3–4
1880.7	33.8	6.40	Hargrave	2

No. 8. Innes 123. Lac. 8352. 7.1
20h 3m 30s — 47° 1′.6.

Comes = 11.0

1896.8	177.°±	6.″±	Innes	1 n

No. 9. h. 5173. Piazzi 19 h. 411. 5.4 Orange
20h 4m 38s — 36° 21′.2.

Comes = 11.3

1834.7	117.°9	15.″±	*h*	1 n
1896.7	119.2	9.20	See	2

Common p.m. of 1″.646 towards 166°.4.
C. P. D. mag. of the chief star = 6.6.

No. 10. β 833. W.B. 20 h. 66. 9.0
20h 6m 23s — 6° 26′.0.

Comes = 11.9

1881.7	63.°7	2.″30	β	2 n
1886.9	76.0	2.52	Miss Lamb	1
1888.1	59.2	2.45	Washburn	4–3

Lal. 38,625, mag. 8.5, is 119″ S.pr.

No. 11. β 1205. Lal. 38,649. 7.0
20h 6m 51s — 8° 23′.4.

7.2 and 9.1

1890.6	50.°0	0.″56	β	3 n
1897.7	46.6	0.70	Aitken	3

No. 12. h. 5177. Lac. 8363. 8.1
20h 6m 54s — 57° 16′.5.

C. Z. 20 h. 169 = 8.2

1835.9	29.°3	8.″05	*h*	3 n
1876.6	27.8	7.67	Sydney	2

Separately observed on the meridian at the Cape and Cordoba.

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No. 13. h. 5178. Lac. 8373. MAG. 6.9
20h 7m 17s — 34° 25′.1.

7.0 and 9.2

1834.7	12.1	2.5 ±	*h*	2 n
1856.7	8.8	2.73	Jacob	2
1876.7	11.5	2.89	Cinc.	2
1877.7	10.0	2.61	,,	2
1879.7	9.4	1.58	β	3–2
1881.7	7.4	2.09	Hargrave	1
1891.5	11.9	2.84	β	3
1896.8	9.6	2.88	See	2

Both stars have been observed on the meridian at Cordoba.

Cor. D. M. – 34°, 14,221, mag. 9.7, 90″ distant, was observed by Jacob.

Misidentified by Prof. See, and registered as λ 410, a "splendid system."

No. 14. Innes 299. C. Z. 20 h. 200. 8.5
20h 7m 20s — 36° 20′.4.

8.9 and 9.9

1897.8	210.±	0.6 ±	Innes	1 n

A fainter star some distance away in the same direction.

Nearly 3 mins. f. the fine pair *h* 5173.

Prof. See measures Innes 299 as follows:—λ 410, 1896.8 9°.6 2″.88 on 2 n. Mags. 6.5 and 10.2.

This measure has been transferred to *h* 5178, to which it evidently belongs. See No. 13.

No. 15. Σ 2643. Lal. 38,698. 6.5
20h 7m 34s — 3° 17′.8.

6.6 and 9.1

1830.9	70.6	3.21	Σ	6 n
1848.7	68.3	3.26	Mitchel	1
1866.3	71.8	3.02	Dembowski	3

No. 16. λ 411. Ö.A. 20,331. 8.5
20h 8m 21s — 20° 32′.4.

Comes = 13.9

1897.7	4.9	2.57	See	1 n

No. 17. Innes 124. Bris. 6817. MAG. 7.7
20h 9m 30s — 63° 28′.0.

Comes = 10.4

1896.6	45.±	2.±	Innes	1 n

Lac. 8368, mag. 6.7, is closely S.f.

No. 18. Innes 125. C. Z. 20 h. 252. 8.2
20h 9m 32s — 46° 12′.8.

8.6 and 9.4

1896.8	40.±	1.±	Innes	2 n

C. Z. 20 h. 287, mag. 8.5, is 68 secs. f. 3′ S.

No. 19. Ormond Stone. Lac. 8392. 7.3
20h 10m 35s — 32° 55′.0.

7.8 and 8.3

1876.2	301.5	3.54	C. G. A.	3–4 n
1876.7	302.9	2.87	Cinc.	1
1879.7	[301.7]	3.10	β	2
1885.6	304.5	2.43	Cinc.	1
1887.7	303.8	2.78	Pollock	4–2
1891.5	303.3	2.36	β	3
1893.7	303.1	2.25	Sellors	1
1896.7	301.7	2.33	See	5

The measure of 1879.7 is the mean of two plus 270°.

Also registered as β 762.

Distance decreasing?

Other measures.

No. 20. Dunlop 230. Lac. 8390. 6.8
20h 11m 8s — 40° 29′.6.

7.4 and 7.7

1836.6	114.9	11.10	*h*	3 n
1879.8	109.7	9.38	Hargrave	1
1887.8	114.0	9.43	Pollock	1
1896.6	113.2*	9.63	Scott	1

Both stars have been observed on the meridian at Cordoba.

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No. 21. Triple. α_2 Capricorni. MAG. 3.8
20h 12m 30s — 12° 51′.3.

A = 3.8 B = 11.3 C = 11.5

A and B + C = *h* 608

1846.7	144.2*	6.62	Mitchel	4 n
1878.5	150.2	7.41	β	3
1889.5	146.8	7.75	„	3
1896.7	152.8	7.44	See	3

B and C = A. G. Clark 12.

1874.6	238.1*	1.48	Holden	2 n
1875.7	245.2	1.14	Hall	1
1878.5	241.2*	1.06	β	2
1878.7	242.4	1. ±	Cinc.	2
1880.1	239.6	0.96	β	2
1886.7	241.2	1.26	Hall	2
1889.5	239.0	1.19	β	3
1896.7	239.1*	1.16	See	2

h 608 is probably equal to HH N. 127, but HH's description is too vague to determine the question.

No. 22. Cordoba [57]. Bris. 6835. 7.8
20h 13m 57s — 55° 7′.4.

8.0 and 10.0

1890.7	2.7	4.30	Sellors	2 n

No. 23. h. 5188. Lac. 8409. 6.4
20h 14m 18s — 29° 30′.7.

6.5 and 9.2

1834.6	70.5	4. ±	*h*	3 n
1877.0	63.7	4.81	Cinc.	3
1896.8	58.8	4.11	See	2

Some change in angle.
C.P.D. combined mag. = 7.6.
Ö.A. 20,404, mag. 8.3, is about 26″ N.pr.
There is a neat 5″ pair to the N. of the above pair, which has been measured by Ormond Stone, H. A. Howe, and others = Ö.A. 20,398.

No. 24. λ 414. C. Z. 20 h. 417. 8.6
20h 14m 22s — 27° 29′.7.

9.1 and 9.7

1897.7	51.9	2.41	See	1 n

No. 25. Barnard. Brad. 2607. MAG. 7.0
20h 15m 9s — 15° 6′.0.

Comes = 10.9

1884.6	105.8	0.85	β	3 n
1886.7	109.6	0.83	Hough	2
1886.8	106.2	1.07	L. McC.	2
1888.7	105.9	0.84	β	4
1891.6	108.0	0.91	„	3
1893.4	102.6	1.12	Barnard	9–7

Preceding β Capricorni, 3.4 mag., by 14 secs.
Discovered in 1883 by Prof. Barnard during an occultation by the moon.
See:—
1884. Barnard, E. E., "Duplicity," *Astr. Nachr.*, Nos. 2588 and 2625.
h 2948 a faint wide pair is near, and forms the subject of a paper by Burnham in *Astronomy and Astrophysics*, 1892, pp. 173, 174.

No. 26. β 662. Ö.A. 20,419. 9.0
20h 15m 10s — 19° 57′.4.

9.4 and 10.4

1878.5	300. ±	1.7 ±	β	1 n

A 7.5 mag. star is 29 secs. pr.

No. 27. h. 5189. C. G. A. 27,871. 8.4
20h 15m 17s — 37° 13′.0.

C. G. A. 27,870 = 9.3

1835.6	296.2	4. ±	*h*	2 n
1881.7	292.6	9.17	C. G. A.	4
1896.8	296.1	7.33	Sellors	3

Probably fixed.

No. 28. Innes 126. C. Z. 20 h. 438. 9.0
20h 15m 19s — 57° 25′.6.

9.5 and 10.0

1894.8	.....	0.9 ±	Innes	1 n
1896.6	pr.	1. ±	„	1

About 40′ S.pr. α Pavonis 2.1 mag.
The most northern of a small triangle of 9th mag. stars.

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No. 29. Schjellerup$_2$ 33. Lal. 39,053. MAG. 8.0
20h 15m 25s — 8° 3′.4.

8.5 and 9.2

1875.5	219°.9	2″.72	Dembowski	4 n
1879.5	218.0	2.80	Cinc.	2
1886.6	217.8	2.93	L. McC.	2
1888.7	219.3	2.85	Haverford	1

Hough 277, an 8.7 mag. star with a faint companion, is 53s f. 1′ S.

No. 30. h. 5190. κ_1 Sagittarii. 5.7
20h 15m 40s — 42° 21′.9.

Comes = 13.0

1834.6	301°.3	15″.±	*h*	1 n

The chief star has a p.m. of 0″.118 towards 154°.4.

No. 31. λ 416. Ö.A. 20,435. 8.7
20h 16m 19s — 28° 2′.7.

Both = 9.5

1897.7	63°.3	1″.00	See	1 n

Prof. See also measures a 13th mag. star 27″ S.pr.

No. 32. β 763. κ_2 Sagittarii. 5.7
20h 17m 5s — 42° 44′.6.

5.9 and 7.9

1879.7	204°.2	1″.24	β	2 n
1887.4	213.3	0.93	Pollock	3–1
1889.5	211.2	1.33	β	4
1891.7	214.7	0.88	Sellors	1
1894.7	213.4	0.73	,,	2
1897.8	195.1	1.40	See	1

A fine pair, but showing no signs of motion.

Registered as a new double star at Arequipa in 1891 (*Harvard Circular*, No. 18). Prof. See also measures a distant faint star.

No. 33. λ 417. Cor. D.M.—35°, 14,087. 9.5
20h 17m 23s — 35° 42′.4.

Comes = 11.7

1896.7	140°.6	3″.42	See	4 n

No. 34. λ . . . Lal. 39,116. MAG. 7.5
20h 17m 24s — 18° 39′.7.

8.0 and 8.6

1897.7	108°.8	2″.43	See	2 n

No. 35. H. N. 138. Ö.A. 20,475. 8.5
20h 18m 50s — 17° 20′.0.

8.9 and 9.8

1780	Class I.		H	1 n
1866.5	331°.8	4″.0	Peters	1
1878.7	330 .6	2 .93	β	1
1878.7	331 .6	3 .00	Cinc.	1

Identification after β, who differs from H and Cinc. Peters's measure is in the *Astr. Nachr.*, 1635.

No. 36. Russell 321. Piazzi 20 h. 111. 6.7
20h 20m 25s — 37° 43′.6.

6.9 and 8.6

1880.9	97°.0	1″.07	Russell	1 n
1890.7	96.0	1.08	Sellors	1
1896.7	99.7	0.78	See	3

No. 37. h. 5194. Lac. 8412. 7.2
20h 20m 26s — 69° 23′.9.

Comes = 11.3

1835.5	250°.9	3″.±	*h*	2 n
1871.7	249.0	4.29	Russell	1
1880.6	261.2	2.78	Cruls	1

No. 38. Howe. Ö.A. 20,494. 8.0
20h 20m 29s — 26° 57′.1.

8.7 and 8.9

1881.7	54°.5	2″.92	Howe	2 n
1889.7	54.5	2.59	Hough	2
1897.2	52.1	2.87	See	3

Noted as double at Cordoba in 1878.

At Cincinnati two coarse double stars are registered about 10′ S. of the above pair.

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No. 39. Mitchel. π Capricorni. MAG. 5.2
$20^h\ 21^m\ 36^s$ $-18°\ 32'.4$.

Comes = 8.8

1846.7	145°.6	2".74	Mitchel	4 n
1847.7	143.0	3.28	„	1
1871.8	144.9	3.15	Knott	3–2
1875.0	145.2	3.27	Dembowski	4
1876.6	146.2	3.47	Cinc.	3
1888.6	146.2	3.49	Haverford	6
1889.7	145.1	3.43	Hall	2
1897.7	146.5	3.45	See	2

The distance has perhaps increased.
The p.m. is very small.
Also registered as β 60.
A few other measures; measured at Sydney in 1872 as ρ Capricorni.

No. 40. H_3. II. 51. ρ Capricorni. 5.0
$20^h\ 23^m\ 9^s$ $-18°\ 8'.6$.

5.1 and 7.6

1783.5	174°.0	.....	H_3	1 n
1846.8	176.2	2.96	Mitchel	6
1856.8	174.7	3.01	Jacob	2
1869.0	174.1	2.83	Dembowski	4
1871.8	174.3	3.41	Knott	1
1879.7	172.1	3.14	Cinc.	1
1886.8	173.1	2.93	L. McC.	1
1888.7	173.6	2.77	Haverford	1

The p.m. is small.
Other measures.
Both stars have been observed on the meridian at the Radcliffe Observatory.
Followed by a faint star first noted as β 61, and by another of the 7.5 mag.

No. 41. Washburn 38. Schj. 8070. 8.9
$20^h\ 23^m\ 53^s$ $-8°\ 21'.5$.

9.0 and 11.3

1881.7	297°.8	2".66	Washburn	3 n
1888.3	294.6	2.56	„	3

No. 42. Washburn 159. B.D.—12°, 5743. 9.3
$20^h\ 24^m\ 13^s$ $-12°\ 35'.8$.

9.9 and 10.2

1888.7	282°.9	1".25	Washburn	3 n

No. 43. Gilliss 259. Lac. 8465. MAG. 7.5
$20^h\ 25^m\ 12^s$ $-41°\ 14'.0$.

Both = 8.3

1876.7	156°.3	2".85	Cinc.	1
1887.8	152.2	2.71	Pollock	3–1
1889.7	152.5	3.23	„	3
1891.2	154.1	2.88	Sellors	2
1896.6	152.4	2.85	See	3

Separately observed on the meridian at Cordoba.

No. 44. h. 5204. C. Z. 20 h. 781. 8.1
$20^h\ 25^m\ 13^s$ $-45°\ 41'.5$.

Comes = 9.0

1836.2	34°.6	6".24	*h*	2 n
1879.7	31.3	5.42	Hargrave	1

No. 45. λ 420. Cor. D.M.—22°, 14,788. 9.7
$20^h\ 26^m\ 42^s$ $-22°\ 1'.8$.

Comes = 13.0

1897.7	88°.3	1".52	See	1 n

No. 46. λ ..... Mayer 867. 7.0
$20^h\ 26^m\ 52^s$ $-16°\ 56'.9$.

Both = 7.8

1897.7	299°.8	0".38	See	1 n

The discovery of this close pair is accorded to Lalande by Prof. See, but without adequate foundation. It is Prof. See's own discovery. See *Astr. Journal*, No. 441.

No. 47. β 668. Mayer 868. 5.2
$20^h\ 26^m\ 55^s$ $-10°\ 11'.7$.

Comes = 10.8

1878.6	29°.0	4".64	β	3 n
1881.7	26.1	4.99	„	4
1890.6	25.0	4.80	„	3
1891.5	27.8	4.64	„	3

Common p.m. of 0".286 towards 66°.7.

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No. 48. Innes 127. C. P. D.—44°, 9839. MAG. 9.0
20h 27m 7s — 44° 51′.0.

9.5 and 10.0

1896.8	100.° ±	0.″6 ±	Innes	2 n

ν Microscopii, mag. 5.1, is 65″ ± S.pr.

No. 49. Jacob [11]. Lac. 8475. 7.2
20h 27m 8s — 40° 53′.9.

7.6 and 8.5

1846.8	226.°3	4.″34	Jacob	1 n
1856.8	226.2	4.34	,,	3
1879.6	225.8	4.7 ±	Cruls	2
1887.7	225.1	4.09	Pollock	2
1891.7	224.5	4.34	Sellors	1
1896.8	222.2	4.32	See	3

No. 50. Hough 133. W.B. 20 h. 612. 8.3
20h 27m 16s — 13° 53′.2.

9.0 and 9.1

1885.2	182.°1	0.″83	Hough	2 n
1886.8	181.2	1.04	L. McC.	2
1888.7	180.9	1.15	Washburn	3
1894.7	180.3	0.93	Hough	1

Also recorded as Washburn 160.

No. 51. Innes 41. Lac. 8491. 7.0
20h 29m 35s — 45° 54′.2.

7.4 and 8.2

1895.9	0.°9	1.″89	Sellors	2 n

C. Z. 20 h. 928, mag. 8.5, is N.f.

No. 52. Dunlop 232. μ_2 Octantis. 6.5
20h 29m 49s — 75° 41′.7.

6.9 and 7.9, both yellow

1836.2	17.°2	18.″7	*h*	3 n
1871.7	17.0	18.0	Russell	1
1872.7	15.6	18.4	Cape M. O.	3–2
1886.6	16.0	17.7	Tebbutt	2

Measured at Sydney as Russell 322.

No. 53. h. 5209. α Indi. MAG. 3.2
20h 30m 32s — 47° 38′.4.

Comes = 12.0

1836.7	194.°8	45.″ ±	*h*	1 n
1896.8	198.8	65.3	Sellors	3

Mr Sellors also notes a 14th mag. companion at 347° ± 65″ ±.

The p.m. of the chief star is 0″.079 towards 17°.9.

In 1878 Mr Russell considered the chief star double, an idea he afterwards abandoned. See "An Astronomical Experiment on the Blue Mountains," *Proc. Roy. Soc. of N.S.W.*

C. P. D. mag. = 5.8.

No. 54. h. 1537. Lal. 39,671. 8.3
20h 30m 32s — 15° 39′.5.

8.8 and 9.3

1829. ±	14.°8*	1.″8 ±	*h*	1 n
1879.5	21.0	3.43	Cinc.	1

No. 55. Ormond Stone. C. Z. 20 h. 1017. 8.9
20h 32m 14s — 26° 49′.5.

9.5 and 9.8

1879.8	245.°3	1.″42	Cinc.	2–1 n
1882.6	245.5	1.78	,,	2
1886.8	245.9	1.71	L. McC.	1

No. 56. Russell 323. C. P. D.—63°, 4604. 8.4
20h 32m 43s — 63° 2′.8.

8.8 and 9.7

1880.6	321.°6	2.″72	Russell	1 n
1891.7	312.9	2.89	Sellors	2
1894.8	313.9	2.51	,,	3

No. 57. λ 422. C. Z. 20 h. 1050. 8.7
20h 33m 36s — 39° 41′.0.

Comes = 14.0

1897.8	225.°1	18.″80	See	1 n

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No. 58. λ 423. Ö.A. 20,698. MAG. 8.2.
20h 34m 4s — 29° 13′.4.
8.5 and 9.8

1897.7	20.°5	0.″72	See	1 n

R. Microscopii, mag. 8.0 to 12.0 is 6s. pr., 4′ N.

No. 59. β 1209. B.D.—17°, 6055. 9.1
20h 35m 17s — 17° 44′.4.
9.5 and 10.4

1890.66	294.°3	0.″45	β	3 n

Lal. 39,888, mag. 7.5, is 22s.4 f. 0′.4 N.

No. 60. Hough 135. 1st Munich 25,521. 7.9
20h 35m 26s — 14° 51′.9.
Comes = 12.9

1883.7	223.°0	2.″44	Hough	2 n
1894.2	217.2	2.41	,,	2

No. 61. Innes 128. Bris. 6902. 8.0
20h 36m 18s — 52° 9′.4.
8.1 and 10.4

1896.7	325.°±	2.″3 ±	Innes	3 n

η Indi, mag. 4.7, is 25 secs. f. 7′ S.

No. 62. β 267. B.D.—4°, 5223. 9.4
20h 36m 29s — 4° 44′.9.
10.0 and 10.3

1878.7	241.°9*	2.″11	β	1 n
1879.3	240.0	2.22	Cinc.	5–3
1882.7	241.3	2.04	,,	2–1

90° has been added to β's angle.

Near *h* 921 = B.D. – 4°, 5222, a coarse pair of 10th mag. stars.

No. 63. Innes 17. Lac. 8534. 7.2
20h 37m 46s — 50° 50′.9.
7.9 and 8.1

1895.8	41.°1*	1.″24	Sellors	2 n

After careful observation here in 1896, 180° has been added to the angle.

The star, 1st Melbourne 1052, mag. 7.3, is about 100″ S.f.

No. 64. h. 2992. B.D.—20°, 6019. MAG. 9.3
20h 38m 35s — 20° 44′.2.
9.8 and 10.3

1831. ±	141.°0	1.″5 ±	*h*	1 n
1878.8	135.8	5.6 ±	Cinc.	1

No. 65. Washburn 162. Schj. 8240. 8.8
20h 38m 41s — 14° 3′.8.
9.4 and 9.7

1888.7	140.°8	1.″72	Washburn	3 n

No. 66. λ 427. Ö.A. 20,795. 8.8
20h 38m 48s — 23° 33′.0.
Comes = 12.1

1896.9	177.°4	1.″57	See	3 n

No. 67. λ 428. Yarnall$_3$ 9248. 6.7
20h 38m 52s — 35° 31′.6.
Comes = 12.2

1896.7	187.°7	4.″41	See	2 n

No. 68. β 674. Yarnall$_3$ 9252. 7.7
20h 39m 3s — 21° 15′.2.
7.8 and 10.5

1877.5	120.°±	1.″3 ±	β	1 n
1877.7	102.8	1.37	Cinc.	2
1879.8	103.4	1.35	,,	2–1
1892.8	99.9	1.19	Hough	1
1897.8	103.1	1.69	See	2

No. 69. h. 5218. Lac. 8546. 6.9
20h 39m 16s — 30° 50′.4.
Comes = 11.0

1834.7	189.°2	6.″±	*h*	1 n
1835.6	191.0	7.±	,,	2
1877.8	194.6	10.11	Cinc.	1

Seen on 1897.8.

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No. 70. Innes 300. Ö.A. 20,840. MAG. 8.5
20h 40m 53s — 17° 3′.8.

9.0 and 9.5

1897.9	310.° ±	4.″ ±	Innes	1 n

The mag. (from Schönfeld) is underrated by 0.5.

No. 71. β 153. Lac. 8566. 7.3
20h 41m 22s — 26° 46′.9.

7.6 and 8.9

1876.8	282.°0	1.″61	Cinc.	1 n
1877.7	282.7	1.27	,,	1
1882.6	286.0	1.65	,,	2
1894.7	280.0	0.89	Sellors	1
1896.8	280.0	1.49	See	2

h 5220 = Lac. 8555, a wide pair, is 27 secs. pr.

No. 72. Rumker 26. Lac. 8550. 5.8
20h 43m 18s — 62° 48′.0.

Both = 6.6 white

1835.1	101.°4	3.″23	*h*	2 n
1856.8	100.3	2.42	Jacob	2
1876.2	95.5	2.80	Sydney	2
1880.6	98.3	2.50	Cruls	1
1885.6	96.9	3.12	Tebbutt	1
1890.7	91.4	2.61	Sellors	4
1894.8	95.2	2.61	Tebbutt	3

The earlier Sydney measures are recorded against *h* 5222 erroneously.

Both stars have been observed on the meridian at Cordoba.

A probable slow decrease in angle.

No. 73. Hough 142. Lal. 40,169. 8.9
20h 43m 39s — 2° 35′.9.

9.6 and 9.8

1885.7	5.°8	0.″62	Hough	2 n

A faint star, 20″ distant.

W.B. 20 h 1004, mag. 6.8, is S.pr.

No 74. h. 5224. α Microscopii. MAG. 5.0
20h 43m 43s — 34° 9′.0.

C. G. A. 28,546 = 9.4

1835.6	164.°5	21.″7	*h*	1 n
1846.7	168.0	20.4	Jacob	2
1856.8	167.3	20.3	,,	2
1875.7	164.8	20.3	C. G. A.	4
1879.8	165.5	20.0	Hargrave	1
1896.7	166.6	20.1	See	2

The p.m. of the chief star is 0″.04 towards 180°.

No. 75. λ 429. C. Z. 20 h. 1442. 8.0
20h 45m 38s — 38° 32′.2.

Comes = 14.0

1896.7	187.°9	2.″86	See	2 n

No. 76. ♅. I. 44. 4 Aquarii. 6.5
20h 46m 8s — 6° 0′.0.

6.8 greenish yellow, and 8.1 orange yellow

1783.4	351.°5	0.″5 ±	♅	1 n
1802.6	28.9	.....	,,	2
1825.6	27.5	0.80	Σ	2
1836.0	46.3	0.41	,,	1
1840.7	65.5	0.6 ±	Dawes	2
1854.7	101.7	0.3 ±	,,	1
1867.9	141.1	0.30	Newcomb	1
1877.1	148.7	0.56	Dembowski	3
1885.7	167.9	0.46	Hall	3
1890.8	178.2	0.49	Tarrant	2
1895.7	184.2	0.33	See	3
1897.8	185.3	0.25	,,	1

A well-known binary pair.

Prof. See's latest orbit is as follows :—

P = 129 years
T = 1899.4
a = 0″.732
e = 0.514
i = 72°.5
Ω = 177°.7
λ = 68°.6

Motion direct.

Ephemeris :—

1899.8	224.°0	0.″14
1900.8	244.1	0.12

From Prof. See's diagram of the orbit (*Evolution*

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of Stellar Systems, vol. i.) it will be seen that there are two apparent periastra :—

260.° ± 0.″11
100.° ± 0.31

The greatest apparent distance is about 0″.76.
The common p.m. is about 0″.06.
Also registered as Σ 2729.

No. 77. h. 3003. Piazzi 20 h. 339. MAG. 6.6
20h 47m 9s — 24° 9′.5.

6.8 yellow, and 8.9 greenish

1830.8	216.°9	3.″±	*h*	1 n
1876.6	216.5	2.32	Cinc.	2
1886.6	216.1	2.38	L. McC.	3
1897.7	217.3	2.37	See	2

Other measures.

No. 78. β 154. Lal. 40,292. 8.0
20h 47m 13s — 16° 32′.5.

8.4 and 9.2

1876.8	61.°8	3.″02	Cinc.	2–1 n
1879.7	59.8	2.88	„	1
1886.8	60.9	2.87	L. McC.	2
1888.6	64.9	2.73	Haverford	1
1890.5	66.3	2.66	Glasenapp	1

Separately observed on the meridian at Cordoba in 1880.
Other measures.

No. 79. Washburn 42. Ö.A. 20,926. 9.1
20h 47m 38s — 17° 41′.5.

9.8 and 9.9

1881.7	228.°2	0.″99	Washburn	3 n
1888.4	223.9	0.97	„	3

Ö.A. 20,935, mag. 9.3, is a little way N.f.

No. 80. λ 431. Lal. 40,311. 6.5
20h 47m 50s — 19° 29′.5.

Comes = 13.7

1897.8	341.°7	2.″63	See	1 n

C. P. D. mag. = 7.6.
See also No. 82.

No. 81. Innes 18. Lac. 8602. MAG. 7.4
20h 47m 53s — 52° 29′.7.

Comes = 11.6

1895.8	2.°±	4.″6 ±	Innes	3 n

Originally wrongly identified as Lac. 8600.

No. 82. λ 432. Lal. 40,330. 7.3
20h 48m 24s — 19° 22′.4.

Comes = 13.3

1897.8	324.°1	2.″27	See	1 n

See also No. 80.

No. 83. Innes 129. Rumker 529. 7.7
20h 48m 34s — 59° 39′.2.

7.9 and 9.8

1896.7	30.°±	1.″±	Innes	2 n

C. Z. 20 h. 1552, mag. 8.4, 15′ N.f., is a neat double, first noted at Cordoba, 8.9 and 9.4, 5″ ± 265° ±.
C. Z. 20 h. 1547, mag. 8.6, is S.f. in this field.

No. 84. Leavenworth. W.B. 20 h. 1179. 7.2
20h 48m 37s — 11° 18′.2.

7.5 and 8.8

1886.7	299.°4	1.″39	L. McC.	2 n
1892.6	298.0	.....	Leavenworth	1
1896.6	291.8	1.21	„	2

No. 85. h. 5231. Lac. 8573. 7.0
20h 48m 57s — 70° 48′.4.

7.7 and 7.8

1836.6	110.°8	7.″62	*h*	3 n
1873.7	113.9	7.82	Russell	1

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No. 86. β 1034. 7 Aquarii. MAG. 5.7
$20^h\ 51^m\ 30^s$ — 10° 4′.9.

Comes = 11.4

1888.7	165°.0	2″.09	β	5 n
1897.7	163.7	2.05	Aitken	3–2

The p.m. of the chief star is small.

No. 87. Gilliss 263. Lac. 8535. 7.3
$20^h\ 51^m\ 42^s$ — 81° 5′.1.

7.5 and 9.5

1890.7	246°.7	4″.57	Sellors	1 n

Both stars have been observed on the meridian at Cordoba.

No. 88. β 764. W.B. 20 h. 1301. 9.0
$20^h\ 53^m\ 27^s$ — 9° 44′.2.

9.7 and 9.9

1879.7	350°.6 ±	[0″.57]	β	3
1880.5	354.4	0.90	„	1
1886.8	353.2*	0.64	L. McC.	2

"The pr. star of a small triangle":—β.

No. 89. β 765. Lac. 8632. 7.1
$20^h\ 54^m\ 24^s$ — 35° 40′.7.

Comes = 12.0

1879.7	140°. ±	2″. ±	β	1 n
1891.8	139.1	2.06	„	3
1891.8	126.4	2. ±	Sellors	1

No. 90. Washburn 165. Ö.A. 21,032. 9.0
$20^h\ 54^m\ 57^s$ — 18° 2′.9.

9.2 and 11.0

1888.7	161°.3	3″.01	Washburn	3 n

No. 91. Hough 461. B.D.—17°, 6149. 9.5
$20^h\ 54^m\ 58^s$ — 17° 28′.3.

10.0 and 10.5

1890.7	224°.7	1″.82	Hough	1 n

21 Capricorni, mag. 6.3, is 16 secs. f. 22′ S.

No. 92. β 678. Lal. 40,636. MAG. 8.2
$20^h\ 55^m\ 25^s$ — 8° 43′.8.

Comes = 11.5

1878.1	185°.9	2″.32	β	2 n
1879.6	191.2	2.32	Cinc.	2
1886.7	192.6	.....	L. McC.	1

No. 93. Innes 257. Lac. 8614. 7.8
$20^h\ 56^m\ 55^s$ — 76° 22′.6.

8.3 and 8.8

1898.7	288°.8	1″.63	Innes	1 n

No. 94. λ 435. Lac. 8660. 6.6
$20^h\ 57^m\ 12^s$ — 28° 7′.5.

7.0 and 8.0

1897.7	289°.7	0″.19	See	1 n

No. 95. Innes 130. Lac. 8650. 7.0
$20^h\ 57^m\ 15^s$ — 48° 21′.3.

Comes = 11.0

1896.1	313°. ±	3″.2 ±	Innes	3 n

No. 96. h. 5233. Lac. 8528. 7.6
$20^h\ 57^m\ 28^s$ — 83° 40′.4.

Comes = 12.5

1837.9	276°.8	15″. ±	*h*	2 n

No. 97. λ 436. Lal. 40,721. 7.4
$20^h\ 57^m\ 58^s$ — 24° 43′.0.

8.0 and 8.3

1897.7	88°.3	0″.23	See	2 n

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No. 98. β 1211. Lal. 40,744. MAG. 8.0
$20^h\ 58^m\ 23^s$ — 18° 30′.4.

8.5 and 9.1

1890.6	344°.7	0″.58	β	3 n
1897.8	349.0	0.52	See	1

"The f. star of a small triangle":—β.

No. 99. Σ 2745. 12 Aquarii. 5.8
$20^h\ 58^m\ 47^s$ — 6° 13′.1.

6.0 orange, 8.0 bluish

1831.3	189°.6	2″.67	Σ	4 n
1846.8	191.0	2.96	Jacob	1
1858.7	192.6	3.05	Morton	2
1866.5	190.6	3.68	Harvard	3
1879.4	190.3	2.94	Cinc.	5
1886.8	191.0	2.86	Washburn	4

Other measures.

No. 100. Harvard. Lac. 8625. MAG. 5.9
$20^h\ 58^m\ 50^s$ — 73° 33′.6.

6.5 and 6.8

1898.0	350°.±	0″.9±	Innes	1 n

The p.m. of this fine pair is $+0^s.11$ in R.A. and $-0''.39$ in Dec., or $0''.606$ towards 130°.1.

No. 101. Hough 462. Lal. 40,790. 8.5
$20^h\ 59^m\ 34^s$ — 11° 29′.1.

8.9 and 9.9

1892.8	215°.7	2″.90	Hough	1 n
1896.1	216.7	2.14	„	3

Lal. 40,765, an elliptical planetary nebula, is 49 secs. pr. 16′ S.

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No. 1. Innes 301. C. P. D.—37°, 8962. MAG. 9.0
21h 0m 35s — 36° 54′.7.
9.5 and 10.0

1897.8	330.±	2.″5 ±	Innes	1 n

Two other small stars are in the field.
A 9.3 mag. star is 24 secs. f.

No. 2. h. 5235. Lac. 8511. 7.5
21h 0m 35s — 84° 43′.3.
8.2 and 8.4, both white

1837.7	271.5*	2.″8 ±	*h*	4 n
1872.7	264.1	3.87	Russell	3
1880.4	266.6	3.24	Sydney	2
1888.6	263.3	3.45	,,	2

Both components have been measured on the meridian at Cordoba.
Mr Russell considers that this pair is identical with *h* 5245.
h measured both in the same sweep (No. 799), when he made *h* 5245, 10m f. and 20′ S. of the above pair, distance 6″ ±, angle nearer 180° than 270°.*

No. 3. Σ 2752. Lal. 40,865. 7.2
21h 1m 37s — 14° 19′.4.
Comes = 11.2

1827.6	145.2	5.″17	Σ	3 n
1848.7	145.3	5.61	Mitchel	1
1866.7	149.4	5.55	Dembowski	3
1878.6	151.9	5.60	β	3

Other measures.
β also records a star of 12th mag. 21″ away = β 157.
The p.m. of the chief star, in which it is evident the Σ companion shares, is 0″.308 towards 97°.5.

No. 4. β 368. Lal. 40,892. 7.0
21h 2m 5s — 8° 38′.2.
7.4 and 8.3

1875.8	99.4	0.″53	Dembowski	2–1 n
1877.8	93.8	0.64	,,	2
1877.8	91.1	.....	Cinc.	1
1879.2	89.6	0.67	,,	4–3
1881.6	90.4	0.63	β	3
1886.6	90.1	0.70	L. McC.	2
1888.6	93.3	0.66	Haverford	2
1890.6	88.7	0.58	β	3

A few other measures.
Two 14th mag. stars 12″ N.f. were measured by β in 1890.

No. 5. β 473. B.D.—10°, 5606. MAG. 8.0
21h 2m 28s — 10° 36′.7.
8.3 and 9.6

1877.1	115.5	1.″74	Dembowski	3 n
1893.5	114.9	1.88	Goodsell	2

No. 6. Hough 149. W.B. 20 h. 1527. 9.0
21h 2m 31s — 12° 5′.8.
9.7 and 9.9

1885.2	335.4*	0.″51	Hough	2 n
1888.7	326.8	0.90	β	4–3
1892.7	326.8	0.57	Hough	2

No. 7. h. 5246. Lac. 8687. 7.2
21h 3m 6s — 54° 58′.7.
7.9 and 8.1

1836.5	116.1	1.″5 ±	*h*	1 n
1856.8	118.1	2.63	Jacob	3
1878.7	121.3	3.62	Russell	2–1
1880.6	126.3	2.30	Cruls	1
1885.6	122.5	3.65	Tebbutt	1
1889.7	123.6	3.17	Pollock	3
1893.8	122.7	2.84	Sellors	2

Some increase in angle, and the distance seems to have passed a maximum.
Both components have been observed on the meridian at Cordoba.
Other measures.

No. 8. Innes 258. Lac. 8694. 7.7
21h 4m 48s — 60° 27′.4.
8.0 and 9.2

1897.7	120.±	0.″7 ±	Innes	1 n

No. 9. β 251. Ö.A. 21,193. 7.2
21h 6m 6s — 30° 59′.8.
7.4 and 8.9

1876.7	229.0	3.″07	Cinc.	1 n
1877.7	234.8	2.58	,,	1
1879.7	234.4	2.09	β	1
1896.7	231.3	3.08	See	3

* Note to No. 2. Neither the C. P. D. nor Gilliss's P. Z. Catalogue contain a star near the given position of *h* 5245.

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No. 10. H. I. 47. Ö.A. 21,208. MAG. 7.5
21h 6m 50s — 15° 24′.5.

8.1 and 8.5

1783.5	354°.8	″.....	H	1 n
1802.7	336.8	.....	„	1
1836.1	328.0	2.12	*h*	2–1
1855.6	323.6*	2.87	Secchi	1
1856.8	323.6	2.75	Jacob	3
1877.7	321.8	3.00	Cinc.	2
1880.6	332.6	.....	Doberck	2
1884.7	318.7*	3.08	Hall	3
1892.8	320.6	3.03	Haverford	3

Other measures.

The change shown is probably due to slow orbital motion.

Also registered as *h* 5252, H's Dec. being about 7′ in error.

No. 11. h. 3014. Lac. 8741. 8.0
21h 8m 54s — 26° 19′.5.

8.7 and 8.8

1831.±	300°.3	2″.8±	*h*	1–2 n
1856.8	294.8	2.13	Jacob	3
1877.2	296.0	2.27	Cinc.	4
1897.1	297.6	1.96	See	3

No. 12. λ 441. Cor. D.M.—25°, 15,323. 9.3
21h 9m 50s — 24° 58′.7.

10.0 and 10.1

1897.7	16°.8	1″.98	See	1 n

No. 13. Lalande 170. Lal. 41,284. 8.0
21h 11m 24s — 8° 4′.3.

8.7 and 8.9

1828.1	172°.1	3″.27	Σ	3 n
1879.0	169.5	3.13	Cinc.	5–4
1890.5	170.9	3.20	Glasenapp	2

Fixed.

Other measures.

Also recorded as Σ 2781.

No. 14. Ormond Stone. Ö.A. 21,272. MAG. 8.4
21h 11m 53s — 27° 38′.7.

8.9 and 9.4

1876.7	236°.9	7″.56	Cinc.	2 n
1896.8	238.0	7.17	See	3

Both components are recorded in the *Cat. Gen. Arg.*

No. 15. h. 5258. θ Indi. 4.6
21h 12m 44s — 53° 52′.1.

4.7 and 7.2

1834.5	307°.0	3″.67	*h*	4 n
1846.4	298.7	2.6±	Jacob	2
1851.3	299.0	3.60	„	5
1852.7	298.4	3.30	„	4
1857.9	297.7	3.59	„	4
1872.1	287.0	4.11	Russell	3
1878.3	292.2	4.25	Melbourne	2
1879.7	289.2	4.18	Sydney	2
1880.6	288.6	3.20	Cruls	2–1
1886.6	287.7	4.51	Tebbutt	2
1886.6	286.9	4.56	Pollock	1
1890.7	285.4	4.34	Sellors	4
1894.8	283.4	3.92	„	3
1895.8	282.4	3.98	„	3

Separately observed on the meridian at Cordoba.

Very evidently a binary, the greatest distance having apparently been passed about 1887.

No. 16. λ 443. Ö.A. 21,283. 7.9
21h 12m 56s — 27° 2′.0.

Comes = 11.8

1897.6	275°.7	2″.03	See	1 n

See note.*

No. 17. β 271. Lac. 8777. 6.7
21h 13m 59s — 26° 45′.9.

6.8 and 9.8

1876.7	[226°.6]	2″.20	Cinc.	1 n
1877.7	234.2	2.07	„	1
1879.7	231.8	2.30	„	2
1886.8	237.5	2.77	L. McC.	1
1891.5	237.2	2.70	*β*	3
1897.2	241.6	3.16	See	5

Some change.

Common p.m. of 0″.718 towards 241°.3.

* Note to No. 16. This star seems to have been measured before in confusion with No. 14. The measures are:

1878.7	276°.8	2″.55	Cinc.	1 n
1888.6	277.7	2.65	Haverford	1

On these occasions only a small difference of magnitude between the components was recorded.

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No. 18. β 252. Lal. 41,364. MAG. 8.0
21h 14m 9s — 27° 43′.5.

8.7 and 8.9

1876.7	99°.8*	2″.54	Cinc.	2 n
1877.7	97.7	2.45	,,	2
1885.6	96.3	2.44	,,	2
1891.7	99.2*	2.67	Haverford	1
1896.9	96.9*	2.59	See	2

Both components have been observed on the meridian at Cordoba.

No. 19. Innes 131. C. P. D.—52°, 11,858. 9.0
21h 14m 47s — 52° 12′.3.

9.5 and 10.0

1896.8	N.	1″.±	Innes	1 n

The f. of a group of four stars.

No. 20. Innes 132. Lac. 8779. 7.5
21h 16m 5s — 52° 22′.0.

Comes = 10.0

1896.8	297°.±	1″.5±	Innes	3 n

The S.f. of three stars in the finder.

No. 21. ℍ. N. 139. Lal. 41,483. 8.0
21h 16m 45s — 15° 20′.5.

8.5 and 9.2

1876.8	115°.8	2″.18	Cinc.	1 n
1878.7	112.8	1.97	,,	3–2
1886.7	116.0	2.08	L. McC.	2
1891.8	113.3	1.79	β	3
1897.7	112.3	1.98	Aitken	3

ℍ gave no measure, and his position was $3\frac{1}{2}$ mins. in error, hence this pair was recorded as β 1262. β mentions that the Dec. was originally printed with the wrong sign; it is, however, correctly printed in *h*'s list in the *Mem. Roy. Ast. Soc.*, vol. xxxv., as well as in his General Catalogue of 10,300 double stars.

No. 22. β 766. θ_2 Microscopii. MAG. 5.9
21h 18m 2s — 41° 26′.1.

6.2 and 7.4

1879.7	314°.2	0″.84	β	2 n
1886.7	302.0	0.5±	Pollock	1
1889.4	307.1	1.06	β	1
1894.8	292.3	0.63	Sellors	3–2
1896.8	281.7	0.94	See	3
1897.8	272.7	0.98	Cogshall	2

A binary pair.

Recorded as a new pair at Arequipa. See *Harvard Circular*, No. 18.

No. 23. β 1035. Piazzi 21 h. 96. 7.8
21h 18m 26s — 25° 59′.4.

Comes = 10.6

1888.7	198°.7	1″.05	β	3 n

No. 24. β 272. Lal. 41,564. 8.7
21h 18m 55s — 13° 13′.1.

Comes = 11.9

1876.2	253°.8	4″.52	Dembowski	3 n
1879.2	255.9	4.43	Cinc.	2

Closely N.f. 18 Aquarii, mag. 5.4 = *h* 5517, it having a faint *comes* 48″ N.pr.

No. 25. λ 445. C. Z. 21 h. 556. 8.3
21h 19m 25s — 39° 38′.4.

8.5 and 10.2

1896.8	219°.6	1″.95	See	2 n

Closely S.f. a pair of stars, mags. 9.3 and 10.0.

No. 26. Hough 158. W.B. 21 h. 397. 8.8
21h 19m 56s — 10° 19′.8.

9.3 and 9.8

1883.8	349°.4	1″.10	Hough	2 n
1895.2	348.9	0.98	,,	2

19 Aquarii, mag. 5.7, is 10′ N.pr.

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No. 27. h. 5267. Lac. 8805. MAG. 7.2
21h 20m 1s — 46° 29′.7.

Comes = 11.0

1834.5	56°.7	5″.00	*h*	1 n

Looked for by Mr Hargrave at Sydney in 1881, but at S. Dec. 45° 30′, and consequently not found. Mr Hargrave saw, however, a more distant *comes* to this star noted by *h*. For an explanation of this anomaly, see the original note.

No. 28. Melbourne [6]. Piazzi 21 h. 107. 5.6
21h 20m 37s — 42° 58′.9.

5.8 and 7.9

1879.7	146°.1	4″.05	*β*	3-2 n
1886.6	146.3	3.47	Pollock	1
1887.7	143.1	3.14	„	3
1891.8	141.0	2.46	Sellors	1

The angle and distance are decreasing.

Also recorded as *β* 767, and in the list of new double stars in the *Harvard Circular*, No. 18.

Noted as double at Melbourne in 1865.

No. 29. λ 446. ξ Capricorni. 3.8
21h 20m 57s — 22° 50′.6.

Comes = 12.7

1896.8	14°.0	21″.59	See	1 n
1897.7	13.4	21.35	„	1

The p.m. of the chief star is 0″.040 towards 301°.3.

C. P. D. mag. = 5.4.

No. 30. Howe. C. Z. 21 h. 615. 8.1
21h 21m 17s — 32° 48′.3.

8.8 and 9.0

1876.8	295°.2*	2″.17	Cinc.	1 n
1877.7	295.5	2.08	„	4
1896.7	292.0	1.77	See	2

C. Z. 21 h. 616, mag. 8.4, is closely N.f.

No. 31. β 683. Piazzi 21 h. 123. MAG. 7.6
21h 21m 51s — 20° 38′.6.

Comes = 10.7

1877.5	198°.4	2″.04	*β*	1 n
1878.8	198.9	2.5 ±	Cinc.	2
1892.8	193.2	2.89	Hough	1

The p.m. is about 0″.13 towards 180°.

No. 32. h. 5271. Cor. D.M.—25°, 15,430. 9.6
21h 21m 54s — 25° 18′.8.

10.0 and 11.0

1834.5	[40°.7]	1″.5 ±	*h*	1 n

C. P. D. mag. = 11.2.

The N.f. star of a small triangle.

No. 33. Schjellerup, 35. Lal. 41,705. 8.6
21h 22m 27s — 13° 52′.0.

9.1 and 9.8

1876.5	131°.8	2″.71	Dembowski	3 n
1879.6	133.5	2.86	Cinc.	2
1886.7	133.7	3.06	L. McC.	2
1891.8	133.4	2.92	Haverford	2

No. 34. Innes 133. C. Z. 21 h. 664. 8.5
21h 23m 4s — 39° 15′.9.

Comes = 11.1

1896.6	24°.4	7″.54	See	5 n

Also found independently by Prof. See and registered as λ 447.

No. 35. λ 448. Piazzi 21 h. 147. 8.3
21h 24m 38s — 24° 51.9.

Comes = 12.3

1897.7	249°.1	1″.29	See	2 n

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No. 36. β 72. W.B. 21 h. 511. MAG. 8.5
21h 24m 47s — 5° 50′.3.

8.7 and 10.7

1877.7	42°.8	1″.89	β	1 n
1878.7	37.0	1.74	Cinc.	1
1886.7	38.0	2.00	L. McC.	4
1890.7	42.2	1.84	β	3
1897.7	37.6	1.89	Aitken	3

Other measures, but probably fixed.

Near β 684 and β Aquarii, mag. 3.1. The latter star is identical with *h* 936, it having some faint distant *comites*.

No. 37. β 684. W.B. 21 h. 517. 9.1
21h 24m 57s — 5° 55′.3.

9.8 and 10.0

1878.6	133°.9	1″.11	β	1 n
1886.8	126.1	1.16	L. McC.	2
1890.7	126.7	1.12	β	3
1897.7	124.8	1.16	Aitken	3

In the field with No. 36.

No. 38. λ 449. Piazzi 21 h. 158. 7.3
21h 25m 49s — 19° 40′.6.

Comes = 12.8

1897.7	197°.0	1″.82	See	1 n

This pair in angle, distance and magnitude resembles β 683, which is about 1° S.pr.

An 8.8 mag. star is closely S.pr.

No. 39. h. 5261. Lac. 8826. 7.8
21h 28m 34s — 86° 17′.6.

8.5 and 8.7

1837.8	27°.0*	6″.5 ±	*h*	2 n
1870.7	21.8*	5.60	Russell	1
1873.7	30.0	6.07	,,	1
1879.8	23.7	4.18	Hargrave	1
1887.8	22.6	5.48	Pollock	3

Other measures, but no certain change.

Mr Russell's second observation will be found in his list of new double stars against Russell 333.

Both stars have been observed on the meridian at Cordoba, where the pr. star is made one mag. fainter than the other. If this is correct, 180° should be added to the above angles, but other observers have considered the magnitudes about equal.

No. 40. Russell 334. Bris. 7029. MAG. 10.0
21h 30m 10s — 83° 14′.0.

Comes = 11.0

1878.8	112°.2	2″.82	Russell	1 n

This star is not recorded in the C. P. D.

No. 41. Innes 302. Lal. 42,108. 9.0
21h 32m 46s — 11° 21′.0.

Comes = 10.0

1897.8	90°. ±	2″. ±	Innes	1 n

Noted whilst observing the occultation of a neighbouring star.

No. 42. Asaph Hall. 1st Munich 29,021. 8.3
21h 33m 4s — 16° 2′.9.

Comes = 11.3

1887.8	127°.6	2″.05	Hall	2 n

Identification somewhat doubtful.

No. 43. β 1212. 24 Aquarii. 7.3
21h 34m 22s — 0° 30′.2.

7.8 and 8.3

1890.75	254°.5	0″.45	β	3 n
1891.75	261.0	0.55	,,	4
1897.81	263.5	0.65	Aitken	3

Common p.m. of 0″.215 towards 81°.5

An 11.6 mag. star is 44″.5 S.f.

No. 44. Cordoba [58]. C. G. A. 29,658. 9.0
21h 34m 37s — 18° 53′.0.

C. G. A. 29,659 = 10.0

1880.8	54°.8	3″.47	C. G. A.	3 n
1897.8	62.9	4.91	See	1

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No. 45. h. 5278. λ Octantis. MAG. 5.4
21h 35m 35s — 83° 10′.7.

5.6 and 7.7, both yellow

1835.6	82°.9	3″.38	*h*	3 n
1871.8	81.4	3.13	Russell	1
1873.8	79.0	3.36	„	1
1877.9	74.9	2.90	Melbourne	2
1886.8	77.7	3.30	Russell	1
1891.8	76.0	2.73	Sellors	1
1893.8	75.3	2.78	„	1

The p.m. is insensible.

Both stars have been observed on the meridian at Melbourne and the Cape.

The chief star may be variable :—

Russell 1871 = 5.0
„ 1873 = 6.5
Gould 1874 = 5.8
Cape 1875 = 7.0
Russell 1886 = 8.5
Innes 1895 = 5.8 (U. A. scale).

No. 46. λ 454. 41 Capricorni. 5.3
21h 36m 19s — 23° 42′.9.

Comes = 13.5

1897.8	198°.0	5″.17	See	1 n

The p.m. of the chief star is 0″.130 towards 144°.5.
C. P. D. mag. = 7.2.

No. 47. λ ..... 1st Munich 29,257. 8.5
21h 37m 23s — 20° 52′.1.

Comes = 10.7

1897.8	57°.3	3″.70	See	1 n

No. 48. Washburn 167. B.D.—14°, 6111. MAG. 9.1
21h 37m 57s — 14° 37′.6.

9.7 and 10.1

1888.7	288°.4	1″.86	Washburn	3 n

No. 49. Leavenworth. W.B. 21 h. 861. MAG. 8.7
21h 38m 11s — 11° 35′.7.

9.0 and 10.2

1886.7	270°.1	1″.46	L. McC.	6 n
1888.7	270.8	1.27	Haverford	3
1891.8	269.9	1.40	„	3–2
1896.7	273.6	1.20	Leavenworth	3–2

No. 50. Howe. Lal. 42,311. 8.5
21h 38m 13s — 26° 58′.4.

8.8 and 10.3

1876.8	299°.6	1″.50	Cinc.	1 n
1872.2	301.3	1.75	„	2
1885.7	303.1	1.50	„	1
1897.2	299.2	1.56	See	4

Ö.A. 21,608, mag. 7.7, is 60 secs. f.

No. 51. λ 455. C. Z. 21 h. 1154. 7.9
21h 38m 37s — 36° 4′.3.

Comes = 12.0

1896.7	94°.8	3″.71	See	2 n

No. 52. λ 456. Ö.A. 21,613. 9.0
21h 39m 29s — 20° 34′.2.

Comes = 11.7

1896.8	57°.2	3″.74	See	2 n

No. 53. Innes 19. Bris. 7075. 7.0
21h 40m 52s — 65° 57′.9

7.2 and 8.8

1896.8	345°. ±	1″. ±	Innes	4 n

Another star = 11.3 mag. is about 15″ pr.

No. 54. λ 458. Ö.A. 21,625. 9.3
21h 41m 0s — 27° 3′.1.

9.9 and 10.3

1897.6	92°.6	0″.41	See	1 n

There is a wide pair 30′ S.

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No. 55. Brisbane. Lac. 8912. MAG. 5.7
21h 41m 45s — 47° 45′.4.

5.8 and 8.8

1834.8	16°.1	20″.±	*h*	2 n
1836.8	14.2	30.3	,,	2
1846.4	10.2	31.1	Jacob	1
1856.8	7.2	33.9	,,	2
1886.6	2.0	42.3	Pollock	1
1896.5	359.8	45.0	Sellors	1

Many other measures.

The change is due to the p.m. of the larger star, and from all the measures it is found to be = 0″.289 towards 158°.9, or

$$\Delta \text{ R.A.} = +0^s.0103$$
$$\Delta \delta = -0''.270.$$

From meridian observations Mr R. P. Sellors finds the p.m. of the chief star to be = 0″.36 towards 153° (see *Astr. Nachr.*, 3423): a sufficiently satisfactory agreement.

Although probably only an accidental coincidence, it is worth noting that the above p.m. is nearly the same as that of δ Capricorni, mag. 2.8, a star some 31° to the north.

No. 56. h. 5296. θ Piscis Australis. 5.2
21h 41m 52s — 31° 21′.7.

Comes = 13.0

1835.1	335°.2	28″.±	*h*	3 n

The p.m. of the chief star is 0″.65 towards 278°.9

No. 57. Triple. W.B. 21 h. 950. 8.0
21h 42m 2s — 13° 35′.1.

A = 8.7 B = 9.8 C = 9.4

A and B = Howe

1879.8	105°.5*	0″.8 ±	Cinc.	1 n
1882.6	96.9	0.92	,,	1
1886.8	106.7	0.95	L. McC.	1
1890.6	104.7	0.64	*β*	3

A + B and C = Σ 2826

1829.4	82°.5	4″.26	Σ	4 n
1848.7	81.6	4.31	Mitchel	1
1886.7	82.2	4.22	L. McC.	2
1890.6	81.9	4.28	*β*	3
1893.7	82.6	3.94	Glasenapp	2

No evidence of change.

No. 58. β 1036. Yarnall$_3$ 9789. MAG. 7.5
21h 42m 5s — 17° 45′.5.

Comes = 10.6

1888.7	205°.9	4″.53	*β*	3 n
1895.8	209.2	4.70	Lick	3
1897.7	205.1	4.76	Aitken	3

No. 59. Ormond Stone. Ö.A. 21,650. 8.8
21h 42m 13s — 27° 39′.8.

9.2 and 10.2

1876.8	177°.6	3″.08	Cinc.	1 n
1877.7	179.4	.....	,,	1
1879.7	177.2	3.18	,,	2
1885.7	186.1	3.±	,,	1
1897.6	174.6	3.88	See	1

Prof. See identifies this pair as Cor. D.M.—27°, 15,615.

No. 60. λ 459. C. Z. 21 h. 1298. 8.9
21h 42m 59s — 32° 51′.9.

9.0 and 11.3

1896.7	167°.9	1″.31	See	3 n

No. 61. Cordoba [59]. C. Z. 21 h. 1311. 9.2
21h 43m 31s — 54° 51′.9.

9.7 and 10.2

1880.8	131°.8	3″.0	C. G. A.	2 n

No. 62. Cordoba [60]. C. Z. 21 h. 1337. 8.6
21h 44m 2s — 26° 6′.5.

9.0 and 10.0

1897.0	306°.2	2″.44	See	5 n

No. 63. λ 460. Lal. 42,547. 8.0
21h 45m 21s — 20° 39′.3.

8.5 and 9.0

1897.7	113°.4	0″.45	See	1 n

Prof. See's Dec. is 6′ wrong.

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No. 64. β 840. 1st Munich 29,706. MAG. 9.4
21h 47m 4s — 2° 10′.9.

9.8 and 10.9

1881.7	39.4	2.57	β	3 n
1886.8	39.1	2.92	Washburn	3
1887.8	36.9	2.94	,,	3

No. 65. h. 5292. Gilliss P. Z. 15,382. 9.0
21h 47m 7s — 85° 12′.8.

Comes = 9.5

1837.8	130.±	3.±	h	1 n
1873.8	152.4	5.27	Russell	1
1896.8	195.±	.....	Innes	1

Identification doubtful; there is a brighter star about 6 mins. f. in the same field.

No. 66. β 168. Piazzi 21 h. 317. 8.1
21h 48m 12s — 20° 28′.9.

8.4 and 9.6

1868.9	73.6	6.10	Harvard	1 n
1876.7	75.5	5.50	Cinc.	2
1877.7	73.7	5.48	,,	2
1896.6	74.0	5.59	Hussey	5

Also recorded as Harvard 168.

No. 67. λ 461. Ö.A. 21,742. 8.9
21h 50m 35s — 27° 45′.8.

Comes = 12.2

1896.8	62.7	3.44	See	2 n

No. 68. β 693. Lal. 42,730. 7.3
21h 50m 57s — 7° 27′.3.

7.5 and 9.8

1877.8	55.0	1.03	Cinc.	1 n
1877.8	50.7	0.97	β	1
1878.7	55.8	0.91	,,	2
1879.2	54.4	1.03	Cinc.	4–2
1886.8	48.7	1.15	L. McC.	1
1894.7	49.8	1.06	Comstock	8–7

Some change?

No. 69. β 169. Ö.A. 21,760. MAG. 8.5
21h 51m 57s — 21° 37′.3.

9.2 and 9.3

1876.8	285.7	1.93	Cinc.	1 n
1877.7	276.0	1.88	,,	2–1
1893.8	279.6	2.26	Sellors	1

The S.f. star of a 95″ pair.

No. 70. Σ 2847. Lal. 42,810. 7.8
21h 52m 56s — 3° 58′.0.

8.5 and 8.7

1831.9	296.6	1.21	Σ	5 n
1847.2	300.5	1.09	OΣ	2
1848.7	303.6	0.83	Mitchel	1
1858.1	301.4	0.7±	Dembowski	2
1879.2	302.3	1.09	Cinc.	7
1885.7	300.1	1.21	Hall	2
1892.7	300.6	1.44	Glasenapp	2

Other measures.

No. 71. h. 3074. 1st Munich 29,941. 8.4
21h 53m 9s — 2° 18′.2.

8.9 and 9.4

1831.±	291.7	1.5±	h	1 n
1879.5	293.4	2.30	Cinc.	2
1886.8	293.4	2.33	L. McC.	2

No. 72. Cordoba [61]. C. Z. 21 h. 1657. 8.6
21h 53m 57s — 30° 27′.6.

9.2 and 9.5

1880.7	278.8	1.31	C. G. A.	4 n

No. 73. β 276. η Piscis Australis. 5.5
21h 55m 6s — 28° 56′.0.

6.1 and 6.5

1876.6	117.4	1.71	Howe	3 n
1877.7	115.5	1.73	Cinc.	3–2
1880.6	113.1	1.73	,,	1
1885.9	118.1	1.81	Hall	2
1888.8	118.5	1.61	β	4–3
1892.7	112.4	1.16	Glasenapp	2
1897.0	117.2	1.81	See	3

Small common p.m.

Prof. Asaph Hall assigns the discovery of this pair to another astronomer. There seems, however, to be no record published earlier than β's, in which case later claims are invalid.

A few other measures.

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No. 74. Hough 468. Lal. 42,899. MAG. 8.2
21h 55m 50s — 17° 59′.8.

Comes = 10.7

1891.8	344°.3	3″.19	Hough	2 n
1897.8	345.0	3.97	See	1

No. 75. Howe. Lal. 42,909. 7.0
21h 56m 6s — 16° 5′.6.

Comes = 11.0

1877.8	270°.3	9″.09	Cinc.	1 n
1878.6	270.5	8.94	β	1

A 9th mag. star pr., with the chief star, form the old pair *h* 5524.

No. 76. South 802. 29 Aquarii. 6.8
21h 56m 58s — 17° 26′.8.

7.2 and 8.1

1831.±	242°.0	4″.±	*h*	1 n
1847.6	242.1*	4.19	Mitchel	1
1857.7	242.5	4.04	Morton	3
1877.7	242.4	4.10	β	1
1880.6	243.4	3.68	Cinc.	1
1890.6	244.1	3.81	Glasenapp	2
1896.7	243.6*	3.92	Hussey	2

Small common p.m.
Stationary.
Other measures.

No. 77. Hough 469. W.B. 21 h. 1280. MAG. 8.3
21h 57m 40s — 2° 57′.7.

8.7 and 9.7

1892.7	27°.2	0″.59	Hough	1 n

o Aquarii, mag. 4.7, is 27 secs. pr. 35′ N.

No. 78. λ 465. Lal. 42,967. 8.5
21h 58m 13s — 25° 19′.8.

Comes = 14.3

1897.7	189°.6	2″.70	See	1 n

Lal. 42,966, mag. 8.6, is closely N.pr.

No. 79. λ 466. C. Z. 21 h. 1811. 8.5
21h 58m 57s — 40° 11′.2.

8.9 and 9.9

1896.6	264°.7	1″.35	See	3 n

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No. 1. h. 5316. Bris. 7121. MAG. 8.0
22h 0m 3s — 59° 36′.9.

8.3 and 9.6

1834.6	142°.2	2″.±	*h*	3 n
1873.8	145.4	5.02	Russell	1
1877.8	149.1	5.01	C. G. A.	4

C. Z. 21 h. 1838 is 2′.5 S.pr.

No. 2. Howe. Lal. 43,088. 8.0
22h 2m 0s — 28° 32′.7.

8.3 and 9.5

1876.8	152°.4	3″.09	Cinc.	1 n
1877.7	151.7	2.39	,,	2
1885.7	153.2	2.52	,,	2
1896.8	150.3	2.63	See	1

Identification after the Cincinnati observers. Prof. See has:—α 22h 1m 27s, δ—28°32′.

No. 3. λ 469. Piazzi 21 h. 400. 7.3
22h 3m 7s — 26° 15′.5.

7.9 and 8.2

1897.7	308°.3	0″.2 ±	See	1 n

No. 4. β 170. Lal. 43,158. 8.5
22h 3m 37s — 18° 58′.3.

8.4 and 8.5

1876.0	63°.7	1″.69	Dembowski	4 n
1876.7	61.6	1.69	Cinc.	2
1878.2	61.8	1.59	,,	2
1882.6	57.3	1.83	,,	2
1886.7	59.6	1.75	L. McC.	6
1893.8	58.2	1.17	Sellors	3–2
1896.7	59.0	1.42	Hussey	2
1897.8	58.6	1.74	See	3

Near 35 Aquarii, mag. 5.8.

h 3092, a wide pair, is N.f., and a 3″ pair measured by Prof. Hussey is 30′ S.pr.

No. 5. λ 470. Ö.A. 21,944. 8.5
22h 4m 57s — 24° 2′.6.

8.9 and 9.7

1897.8	32°.2	1″.81	See	2 n

No. 6. Leavenworth. 1st Munich 30,345. MAG. 8.9
22h 5m 13s — 11° 33′.2.

9.6 and 9.8

1886.8	164°.6	0″.93	Leavenworth	2 n
1890.8	164.0	0.85	β	3

Near e_1 and e_2 Aquarii.

No. 7. β 769. Lac. 9046. 6.6
22h 5m 47s — 34° 57′.4.

7.1 and 7.8

1879.7	348°.6	0″.6 ±	β	1 n
1891.8	351.6	0.91	,,	3
1897.8	342.4	0.46	See	1

No. 8. h. 5319. Lac. 9047. 7.2
22h 6m 6s — 38° 47′.6.

Both = 8.0 yellow.

1836.1	110°.4	1″.72	*h*	4 n
1851.9	116.4	2.30	Jacob	2
1852.7	113.5	1.47	,,	2
1856.8	113.2	2.06	,,	2
1877.6	116.1	2.14	Cinc.	2
1879.9	117.7	1.60	Hargrave	1
1889.2	118.9	2.02	Pollock	2
1891.8	117.4	1.85	Sellors	3
1895.9	118.3	.....	Doberck	2
1896.6	120.2	2.06	See	3

Both stars have been observed on the meridian at Cordoba.

The identity with *h* 5319 was overlooked in the 1889.2 measure.

No. 9. Cordoba [62]. Lac. 9048. 7.6
22h 6m 41s — 49° 32′.9.

7.8 and 10.0

1889.9	353°.2	4″.85	Pollock	3 n

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No. 10. β 475. **Lal. 43,305.** MAG. 8.3
22h 7m 19s — 8° 30′.4.

Comes = 11.2

1879.8	230°.6	1″.±	Cinc.	1 n
1886.8	236.5	1.62	L. McC.	2
1891.8	228.3	1.51	β	3
1897.9	229.0	1.46	Hussey	3

No. 11. β 1215. **Rumker 9936.** 9.0
22h 7m 48s — 11° 40′.2.

9.7 and 9.8

1890.8	90°.2	1″.53	β	3 n
1896.8	91.1	1.54	Aitken	3

No. 12. H. N. 56. **41 Aquarii.** 5.5
22h 8m 47s — 21° 34′.3.

5.7 orange, and 7.7 blue

1787.7	S.f.	″.....	H	1 n
1847.6	119°.6	4.22	Mitchel	2
1876.7	118 .0	5.22	Cinc.	2
1877.7	116 .6	5.03	,,	3
1882.7	118 .0	5.44	,,	1
1886.7	115 .7	5.01	Hall	3
1890.6	116 .0	4.61	Glasenapp	2
1897.7	117 .5	5.10	See	1

Common p.m. of o″.07.

Also registered as South and *h* 339, and again as a new pair (No. 12) at Cincinnati in 1883.

C. P. D. mag. = 6.6.

No. 13. **Hough 472.** **C. Z. 22 h. 270.** 8.5
22h 10m 19s — 23° 12′.5.

..... and .....

1889.8	244°.8	3″.98	Hough	2 n

Lac. 9078, mag. 7.3, is 14 secs. f. and 18′ S.

No. 14. **Innes 20.** **Lac. 9067.** 6.8
22h 10m 58s — 63° 18′.6.

7.3 and 7.8, both white

1894.9	340°.±	0″.6 ±	Innes	2 n

No. 15. **Harvard.** **Lac. 9076.** MAG. 5.4
22h 11m 42s — 54° 6′.5.

1891	Double	.....	Arequipa	– n

The chief star has a p.m. of o″.80 towards 147°.3.

No. 16. **Innes 303.** **Lac. 9084.** 8.2
22h 12m 20s — 50° 24′.2.

A = 8.2 B = 10.0 C = 10.0

A and B + C

1897.8	40°.±	20″.±	Innes	1 n

B and C = C. P. D. – 50°, 11,683

1897.8	80°.±	1″.±	Innes	1 n

No. 17. **Innes 134.** **Lac. 9104.** 7.7
22h 16m 3s — 56° 39′.4.

8.3 and 8.7

1896.8	300°.±	0″.6 ±	Innes	1 n

No. 18. **Innes 135.** π_1 **Gruis.** 6.7 Red
22h 16m 37s — 46° 27′.1.

Comes = 11.5

1896.8	190°.±	2″.5 ±	Innes	1 n

Requiring a steady night.

The chief star has been thought variable. See *Catalogue of Magnitudes of* 1081 *Stars*, by A. Stanley Williams, p. 41, No. 1019.

No. 19. β 172. **51 Aquarii.** 5.8
22h 18m 54s — 5° 20′.6.

6.5 and 6.7

1875.7	20°.4	0″.46	Dembowski	6–2 n
1877.8	25.7	0.5 ±	Cinc.	1
1877.8	25.2	0.47	β	2
1878.6	24.7	0.56	,,	2–1
1879.3	19.6	0.66	Cinc.	4–3
1879.4	19.1	0.5 ±	Schiaparelli	2
1886.7	16.8	0.78	L. McC.	2
1891.6	12.1	0.68	β	3
1893.8	9.4	0.55	Comstock	3
1895.8	7.3	0.57	Lick	3
1895.8	6.2	0.06	Comstock	4
1897.7	5.3	0.73	Aitken	3
1897.9	10.4	0.67	Hussey	3

A binary pair in slow motion.

The p.m. is very small.

Three distant companions make H V. 95.

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No. 20. Innes 136. C. Z. 22 h. 554. MAG. 7.5
22h 19m 53s — 45° 37′.2.

7.7 and 9.2

1896.8	265.°±	1.″8±	Innes	1 n

C. Z. 22 h. 559, mag. 8.0, is 11.5 secs. f. 7′ N.

No. 21. h. 5334. δ Toucani. 4.7 Yellow
22h 20m 13s — 65° 28′.5.

Comes = 9.2 greenish

1836.2	282.°3	6.″84	*h*	2 n
1872.8	284.9	6.77	Russell	2
1880.6	283.3	4.33	Cruls	1

The p.m. of the chief star is very small.

Both stars have been observed on the meridian at Cordoba.

The last distance is much too small.

No. 22. Innes 137. Lac. 9125. 6.9
22h 20m 46s — 58° 30′.6.

Comes = 10.5

1896.8	315.°±	1.″5±	Innes	1 n

C. Z. 22h 587, mag. 7.6, is 20 secs. f.

No. 23. Bradley. *f* Aquarii. 5.6
22h 21m 8s — 17° 15′.1.

6.3 and 6.5

1783.7	295.°±	″	ℍ′	1 n
1826.0	300.0	10.±	*h*	1
1866.7	302.9	8.32	Harvard	2
1876.8	305.9	8.42	Cinc.	3
1882.7	306.5	7.99	„	3
1886.9	304.2	7.44	Hall	3
1890.6	306.4	6.73	Glasenapp	2
1895.8	309.4*	6.79	Doberck	3
1896.6	308.7	7.34	Hussey	3

Common p.m. of about 0″.2 towards 91°.

Also registered as ℍ N. 41, and South and *h* 345.

Other measures.

No. 24. C. Mayer. ζ Aquarii. MAG. 3.8
22h 23m 41s — 0° 31′.9.

4.5 and 4.6

1779.8	18.°9	4.″77	ℍ	2 n
1822.3	0.5	4.98	*h*	1
1839.8	350.4	3.85	OΣ	3
1862.8	339.3	3.53	Dembowski	9
1888.9	325.6	3.42	Maw	5
1894.0	321.2	3.07	Bigourdan	2
1896.7	321.2	3.33	Hussey	3

A binary pair in which the angle and distance are decreasing.

Many other measures.

Also called ℍ II. 7, Σ 2909, and South and *h* 346.

See :—

1875. Doberck, W., "Orbit," *Astr. Nachr.*, No. 2050.

1897. Burnham, S. W., "Motion," *Popular Astronomy*, vol. iv. pp. 474–475.

No. 25. λ 474. Lac. 9144. 7.5
22h 23m 49s — 29° 10′.2.

8.0 and 8.6

1896.7	289.°8	0.″56	See	2 n

Yarnall$_3$ 10,146, mag. 8.5, is 4′ S.pr.

No. 26. β 478. 1st Munich 31,036. 9.1
22h 24m 11s — 7° 50′.7.

9.3 and 11.3

1878.2	32.°7	1.″32	*β*	2 n
1886.8	32.2	1.38	L. McC.	1

A 9.3 mag. star 29″ away, and a fainter one in the opposite quadrant, are noted by *β*.

No. 27. β 76. Lal. 43,906. 8.5
22h 24m 24s — 0° 43′.0.

8.7 and 10.6

1867.9	332.°1	1.″50	Harvard	1 n
1876.2	335.3	1.47	Dembowski	4
1879.2	333.6	1.48	Cinc.	3
1888.9	338.2	1.24	Haverford	2

In a low power field with ζ Aquarii (No. 24.)

In the *Harvard Annals* this pair is called "Alvan Clark 22."

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No. 28. β 1264. Lal. 43,933. MAG. 7.7
$22^h\ 25^m\ 3^s$ — 0° 22′.4.

Comes = 13.2

1891.7	21°.7	3″.85	β	3 n

N.f. ζ Aquarii (No. 24).

No. 29. Washburn 169. Ö.A. 22,195. 8.7
$22^h\ 25^m\ 27^s$ — 19° 41′.8.

8.9 and 10.4

1886.7	172°.8	1″.39	L. McC.	2 n
1896.5	169.8	1.38	Hussey	2

No. 30. Piazzi. β Piscis Australis. 4.5
$22^h\ 25^m\ 49^s$ — 32° 51′.5.

Comes = 7.5

1836.2	173°.3	29″.1	*h*	2 n
1876.6	171.0	30.2	C. G. A.	5

Also registered as Dunlop 240.
Common p.m. of 0″.047 towards 167°.8.

No. 31. Melbourne [7]. 1st Melb. 1144. 8.6
$22^h\ 26^m\ 41^s$ — 61° 19′.9.

8.9 and 10.3

1891.8	124°.3	2″.±	Sellors	1 n
1896.8	123.8	3.95	,,	3

Separately observed on the meridian at Cordoba.

No. 32. λ 475. C. Z. 22 h. 767. 8.5
$22^h\ 27^m\ 25^s$ — 39° 15′.1.

9.1 and 9.5

1896.7	292°.7	0″.55	See	3 n

No. 33. β 77. B.D.—2°, 5780. 8.8
$22^h\ 28^m\ 53^s$ — 2° 18′.7.

9.2 and 10.0

1876.0	213°.0	2″.65	Dembowski	3 n
1877.8	213.6	2.55	Cinc.	2
1882.7	214.3	2.61	,,	2
1886.8	212.0	2.71	L. McC.	4
1888.7	213.3	2.77	β	3

An 11.5 mag. star 29″ distant.
60 Aquarii, mag. 5.9, is 12′ N.f.

No. 34. β 770. Lal. 44,059. MAG. 7.6
$22^h\ 28^m\ 53^s$ — 23° 7′.1.

Comes = 10.9

1879.8	360°.±	1″.2 ±	β	1 n
1891.9	352.8	1.36	,,	3

No other measures found.

No. 35. h. 5344. Lac. 9177. 7.9
$22^h\ 29^m\ 47^s$ — 39° 14′.5.

8.1 and 10.1

1836.8	173°.3	4″.±	*h*	1 n
1889.8	167.2	5.20	Pollock	2
1896.7	169.3	4.65	See	5

Both stars have been observed on the meridian at Cordoba.

No. 36. β 771. Piazzi 22 h. 152. 5.7
$22^h\ 31^m\ 9^s$ — 41° 6′.5.

Comes = 10.3

1879.6	270°.±	1″.3 ±	β	1 n
1891.8	259.1	2.23	Sellors	2
1891.9	263.1	2.46	β	3
1897.0	265.1	2.38	See	3

The p.m of the chief star is 0″.096 towards 200°.6
Registered as a new pair at Arequipa in 1891.
Piazzi 22 h. 147, mag. 6.1, is 30 secs. pr.

No. 37. Innes 138. Lac. 9188. 6.6
$22^h\ 32^m\ 0^s$ — 40° 22′.6.

Comes = 11.3

1896.8	279°.4	3″.44	See	2 n

When discovered, the *comes* was considered to be certainly closer than that of β 771. See No. 36. This deception probably arises through the faintness of the small star.

No. 38. h. 5348. C. Z. 22 h. 944. 8.5
$22^h\ 32^m\ 41^s$ — 59° 19′.6.

8.7 and 10.7

1836.7	275°.4	3″.±	*h*	1 n

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No. 39. ℍ. N. 117. Bris. 7191. MAG. **7.5**
22h 34m 12s — 28° 52′.1.

7.9 and 8.7

1834.5	59°.2	2″.±	*h*	1 n
1846.9	60.6	3.12	Jacob	1
1857.9	57.9	3.45	,,	2
1877.7	59.9	3.38	Cinc.	2
1881.8	59.7	2.94	*β*	3
1897.7	61.8	3.37	See	3

Both stars have been observed on the meridian at Cordoba.

Also registered as *h* 5356.

Other measures.

Lac. 9204, mag. 6.3., is 87″ N.pr., and with the above pair has been recorded as a double star by ℍ and Dunlop.

No. 40. Lalande 180. Lal. 44,276. **8.0**
22h 34m 15s — 13° 7′.8.

8.7 and 8.8

1830.8	327°.7	4″.70	Σ	3 n
1848.7	324.2	4.09	Mitchel	1
1863.1	319.3	4.38	Dembowski	4
1866.2	319.1	4.33	,,	2–1
1877.5	316.8	4.43	Cinc.	3
1880.8	317.1	4.49	Pritchett	3
1888.8	315.6*	4.15	Hall	3
1892.8	315.8	4.17	Haverford	5
1895.9	314.4	4.60	Doberck	4–2

Some change.

Common p.m. of 0″.291 towards 118°.8.

Also called Σ 2928.

No. 41. *β* 709. B.D.—3°, 5487. **8.5**
22h 36m 28s — 3° 4′.4.

8.8 and 10.0

1877.9	9°.8	2″.09	*β*	2 n
1878.8	7.0	1.94	,,	1
1886.8	6.0	2.13	L. McC.	2
1888.9	5.1	1.50	Haverford	1
1893.7	14.1	1.6 ±	Glasenapp	2
1896.8	5.4	2.04	Leavenworth	3

No materials exist for a determination of p.m.

A probable decrease in angle.

No. 42. Cordoba [63.] Lac. 9210. MAG. **6.5**
22h 36m 39s — 47° 43′.5.

Comes = 10.5

1879.5	124°.9	8″.22	C. G. A.	2 n
1894.9	140. ±	5. ±	Innes	1
1897.8	135.2	7.88	See	2

The p.m. of the chief star is 0″.320 towards 181°.8. It is evident that it is common to the companion.

Thought to be new when the estimate was made in 1894.

Near *β* Gruis, mag. 2.1, orange yellow.

Called *h* 5362 in error by Prof. See, see No. 47.

No. 43. Ormond Stone. C. Z. 22 h. 1093. **7.7**
22h 37m 17s — 32° 9′.2.

8.1 and 9.1

1876.7	34°.8	3″.38	Cinc.	1 n
1877.7	37.4	2.98	,,	1
1885.7	34.3	2.98	,,	1
1896.7	32.7	2.86	See	5

Noted as Class I. at Cordoba in 1874.

No. 44. ℍ. I. 50. Mayer 963. **7.0**
22h 37m 49s — 8° 50′.1.

7.2 and 8.7

1782.7	311°.2	″.....	ℍ	1 n
1831.2	311.3	2.57	Σ	3
1846.6	311.5	2.58	Jacob	1
1866.1	311.2	2.59	Dembowski	3
1886.9	311.4	2.68	L. McC.	2
1892.8	310.0	2.69	Glasenapp	2–1

Also recorded as Σ 2935.

Both stars have been observed on the meridian at Cordoba.

Other measures.

Also recorded as ℍ. N. 128 and 133.

The p.m. is very small.

No. 45. Cruls. *η* Gruis. **4.9**
22h 39m 30s — 54° 1′.6.

Comes = 12.0

1879.6	185°.3	27″.6	Cruls	1

Also registered in error as a new pair = Innes 139.

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No. 46. λ 476. Ö.A. 22,382. MAG. 8.6
22h 39m 42s — 23° 37′.6.

Comes = 13.5

1896.8	39°.5	3″.92	See	1 n

Ö.A. 22,381, mag. 8.3, is 8′ N.pr.

No. 47. h. 5362. Lac. 9237. 6.9
22h 40m 48s — 47° 28′.0.

C. G. A. 31,000 = 9.6

1836.7	139°.1	8″.±	*h*	1 n
1856.8	141.5	10.65	Jacob	2–1
1880.9	139.1	8.96	Hargrave	1
1897.8	138.7	10.26	See	1

The components have been separately observed on the meridian at Cordoba.

Registered as λ 477 by Prof. See, who identified the chief star as Lac. 9229 which is about 25′ N.pr.

No. 48. Innes 304. C. P. D.—48°, 10,811. 8.0
22h 40m 51s — 48° 50′.6.

8.4 and 9.4

1897.8	N	4″.±	Innes	1 n

No. 49. Innes 140. Lac. 9241. 8.3
22h 41m 36s — 55° 1′.5.

8.5 and 10.5

1896.8	270°.±	3″.±	Innes	1 n

The following star of a group of three or more.

No. 50. H. II. 57. Bradley 3011. 7.0
22h 42m 41s — 4° 44′.9.

7.6 and 7.9

1792.7	243°.1	.....	H	2 n
1822.9	245.6	4.35	South and *h*	–
1833.0	246.9	4.12	Σ	8
1862.6	250.5	3.08	Dembowski	3
1877.9	252.8	3.88	β	1
1886.8	254.5	3.67	L. McC.	2
1892.7	257.9	3.25	Glasenapp	2

Also called Σ 2944.

There are other somewhat discordant measures.

Common p.m. of 0″.355 towards 219°.5, by which this pair is passing the 8.9 mag. star, Piazzi 22 h. 220, some measures being :—

1831.8	158°	56″	Σ
1862.7	146	51	Dembowski
1877.9	141	49	β
1892.7	134	47	Glasenapp

No. 51. Innes 141. Ö.A. 22,432. MAG. 9.1
22h 43m 50s — 20° 47′.3.

9.6 and 10.1

1896.5	N.pr.	2″.±	Innes	1 n
1897.9	319°.6	2.70	See	1

No. 52. Washburn 53. Rumker 10,641. 9.0
22h 43m 57s — 7° 2′.4.

9.3 and 10.5

1881.7	2°.3	1″.51	Washburn	3 n
1886.8	1.5	1.73	L. McC.	3–4
1887.7	358.0	1.73	Washburn	3

No. 53. β 1219. W.B. 22 h. 885. 8.9
22h 44m 30s — 11° 35′.7.

9.4 and 10.1

1890.82	307°.9	0″.54	β	3 n
1896.84	299.3	0.48	Aitken	3

β's R.A. is 1m in error.

β notes a 6″ pair about 5′ N.pr. = B.D. – 11°, 5931, mag. 8.7.

No. 54. h. 5365. Lac. 9282. 7.0
22h 46m 8s — 36° 25′.1.

Comes = 11.6

1835.8	274°.0	2″.5 ±	*h*	1 n
1896.7	278.2	4.83	See	2

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No. 55. h. 5367. γ Piscis Australis. MAG. 4.6
22h 46m 58s — 33° 24′.3.

Comes = 8.8

1835.5	276.°8	3.″59	*h*	2 n
1850.9	275.3	4.18	Jacob	2
1853.3	274.5	4.19	,,	6
1856.9	275.3	4.39	,,	2
1876.8	269.4	4.13	Cinc.	2
1877.8	271.7	4.17	,,	2
1879.7	271.6	3.47	β	2
1885.3	272.4	4.05	Cinc.	3
1890.8	269.2	3.6 ±	Sellors	2
1892.6	271.7	3.60	Scott	2
1894.8	268.6	3.51	Sellors	2
1896.7	267.5	4.46	See	1

Common p.m. of 0″.065 towards 251°.1.
Also measured by Secchi.

No. 56. β 177. Ö.A. 22,454. 8.0
22h 47m 0s — 22° 14′.3.

8.7 and 8.8

1867.9	276.°6	3.″07	Harvard	1 n
1877.7	278.7	2.79	Cinc.	2
1888.8	277.1	2.63	Haverford	2
1893.8	276.1	2.55	Sellors	3

Equal to Harvard 173.
Other measures.

No. 57. Innes 22. Lac. 9295. 6.8
22h 49m 27s — 49° 0′.0.

7.2 and 8.2

1894.9	200.° ±	0.″6 ±	Innes	4 n
1897.8	170. ±	0.6 ±	,,	1

τ_2 Gruis, mag. 6.5, is about 95″ S.pr.

No. 58. β 178. Piazzi 22 h. 250. 5.8
22h 50m 0s — 5° 31′.2.

6.0 and 7.8

1875.4	324.°6	Obl.	Dembowski	3 n
1877.8	328.9	0″.6 ±	Cinc.	2
1879.6	319.9	0 .66	,,	1
1886.8	322.1	0 .86	L. McC.	3–2
1888.9	322.2	0 .70	Haverford	3–2

No. 59. β 1010. Lal. 44,832. MAG. 9.0
22h 50m 20s — 6° 6′.8.

9.6 and 9.9

1881.8	136.5	1.21	β	2 n
1892.9	134.8	1.28	Hough	1

The magnitude (from Schönfeld) is probably too faint.
Lal. 44,827, mag. 7.7, is about 7′ S.pr.

No. 60. Howe. δ Piscis Australis. 4.1
22h 50m 25s — 33° 4′.1.

Comes = 9.7

1877.7	236.°5	4.″73	Cinc.	1 n
1879.7	238.4	5. ±	β	5
1881.8	235.8	4.91	,,	4–5
1885.7	236.9	4.77	Cinc.	2
1891.9	239.7	4.78	β	3
1896.7	235.6	5.14	See	2

P.m. of 0″.09 towards 360°.
Also discovered independently as β 772. Both stars were observed on the meridian at Cordoba in 1878.
C. P. D. mag. = 5.8.

No. 61. λ 478. Fomalhaut. 1.3
22h 52m 7s — 30° 9′.1.

Comes = 14.0

1896.7	36.°2	30.″0	See	1 n

No. 62. Ormond Stone. 1st Munich 31,829. 8.8
22h 53m 23s — 8° 59′.3.

9.2 and 10.2

1880.6	132.°5	2.″46	Cinc.	2–1 n

No. 63. β 1011. Lac. 9343. 6.6
22h 57m 0s — 36° 57′.5.

6.7 and 9.7

1881.8	301.°7	2.″16	β	3 n
1886.9	301.2	2.26	Pollock	1
1891.8	293.0	1.94	Sellors	1
1896.7	291.5	1.61	See	4

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No. 64. β 384. Lal. 45,047. MAG. **7.0**
22h 57m 18s — 19° 4′.8.

7.2 and 9.3

1876.8	75°.0	1″.08	Cinc.	1 n
1877.1	72.2	1.27	Dembowski	3
1877.6	72.5	1.22	Cinc.	2
1886.8	70.4	1.27	L. McC.	1
1888.8	73.4*	1.03	Haverford	1
1897.7	69.1	1.37	See	1

No. 65. β 481. W.B. 22 h. 1162. **9.1**
22h 57m 27s — 11° 46′.5.

9.6 and 10.1

1878.2	51°.8	1″.30	β	2 n
1891.9	53.1	1.19	„	3

In the field with Σ 2970, an 8″ pair.

No. 66. Cordoba [64]. Lac. 9349. **8.1**
22h 58m 16s — 46° 42′.4.

8.3 and 9.9

1889.8	108°.6	3″.05	Pollock	3 n
1894.3	107.6	2.79	Sellors	2
1897.8	105.5	3.55	See	1

No. 67. Innes 259. Lac. 9346. MAG. **7.5**
22h 58m 17s — 55° 34′.0.

8.0 and 8.5

1897.7	100°. ±	0″.9 ±	Innes	1 n

No. 68. [Sellors .] Gilliss P. Z. 16,143. **8.8**
22h 58m 52s — 75° 18′.4.

8.9 and 11.4

1890.9	73°.1	3″.8 ±	Sellors	2 n

h 5381 = Gilliss P.Z. 16,161, mag. 9.3, a somewhat similar pair, is about 20′ S.f.

No. 69. h. 5382. C. Z. 22 h. 1701. **8.2**
22h 59m 11s — 51° 53′.6.

Both = 9.0 white

1836.3	49°.8	7″.5 ±	*h*	2 n
1876.8	49.3	7.28	Sydney	2

Fixed.

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No. 1. h. 5381. Gilliss P. Z. 16,161. MAG. 9.3
23h 0m 14s — 75° 33′.5.

10.0 and 10.2

1835.7	50°.2	3″.±	*h*	1 n
1880.9	52.8	3.11	Hargrave	1
1891.1	54.2	3.±	Sellors	1

Mr Hargrave's measure is recorded against *h* 5379.

A brighter pair of the same class will be found 20′ N., a little pr.

No. 2. Howe. W. B. 22 h. 1223. 8.8
23h 0m 18s — 4° 47′.3.

Comes = 11.3

1879.6	213°.9	3″.84	Howe	1 n
1885.7	212.3	4.22	Cinc.	1
1888.9	210.4	4.03	Haverford	1

No. 3. Jacob [12]. θ Gruis. 4.4
23h 1m 15s — 44° 3′.6.

4.5 white and 8.2 bluish

1845.9	11°.3	3″.05	Jacob	2–1 n
1846.3	11.5	3.06	,,	1
1851.9	10.6	2.91	,,	4
1852.8	12.2	2.85	,,	6
1870.7	13.2	2.30	Russell	2
1881.8	22.0	2.65	*β*	2
1887.7	22.1	2.33	Tebbutt	1
1891.8	23.1	1.28	Sellors	2
1891.9	26.1	2.08	*β*	3
1895.8	28.6	2.02	Sellors	3
1897.7	23.9	2.94	See	1

A fine pair in which an increased motion in angle is apparent. Distance decreasing.

Common p.m. of 0″.098 towards 241°.9.

Identical with *β* 751.

C. P. D. mag. = 5·6

No. 4. Dunlop 246. Lac. 9367. 6.1
23h 1m 28s — 51° 13′.6.

6.6 and 7.1, both yellow

1835.7	260°.5	8″.12	*h*	3 n
1872.1	258.3	8.42	Russell	3
1879.8	260.8	7.89	Hargrave	1
1887.7	258.9	8.33	Tebbutt	1

Both stars have been observed on the meridian at the Cape (in 1840) and elsewhere.

The p.m. is small.

No. 5. Σ 2980. Lal. 45,298. MAG. 8.1
23h 4m 0s — 7° 51′.4.

8.2 and 10.7

1831.1	107°.9	4″.16	Σ	4 n
1866.4	111.5	4.41	Dembowski	3
1877.9	108.3	4.26	Cinc.	2
1886.9	109.7	4.68	L. McC.	2

Σ 2981, a pair of faint stars, 4″ apart, is about 1° 30′ S., a little f.

No. 6. Lalande 185. Lal. 45,379. 6.9
23h 6m 46s — 12° 28′.6.

7.6 and 7.8

1830.9	281°.0	3″.73	Σ	3 n
1851.9	281.3	3.59	Jacob	2
1866.4	280.2	3.41	Dembowski	3
1882.7	281.3	3.82	Cinc.	2
1886.7	280.0	3.82	L. McC.	2
1892.7	278.4*	3.51	Glasenapp	2

Also recorded as South 824, and Σ 2988.

Separately observed on the meridian at several observatories.

Other measures.

No. 7. Washburn 170. B.D.—22°, 6088. 8.0
23h 7m 27s — 22° 28′.9.

8.4 and 9.4

1888.7	277°.7	1″.46	Washburn	3 n

No. 8. Howe. C. Z. 23 h. 160. 7.5
23h 7m 33s — 32° 51′.6.

Comes = 10.6

1877.8	266°.3	6″.87	Cinc.	2 n
1896.7	266.4	7.23	See	2

Registered inadvertently as Innes 142.

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No. 9. h. 5387. Lac. 9400. MAG. 7.7
23h 7m 59s — 41° 28′.8.

8.0 and 9.2

1836.0	279°.3	10″. ±	*h*	2 n
1880.9	277.9	7.43	Hargrave	1
1896.8	278.7	7.93	See	2

Both stars have been observed on the meridian at Cordoba.

No. 10. β 181. Lal. 45,443. 6.8
23h 8m 34s — 13° 56′.3.

6.9 and 9.7

1876.3	309°.2	1″.51	Dembowski	4 n
1878.7	307.8	1.41	Cinc.	1
1885.8	312.5	1.42	„	3
1886.8	309.1	1.57	L. McC.	5–3
1888.8	305.3	1.31	Haverford	3–1

An 11.4 mag. star, 19″ S.pr., noted by β.

No. 11. β 714. Piazzi 23 h. 17. 7.1
23h 8m 58s — 3° 10′.7.

Comes = 10.1

1877.8	154°.9	0″.7 ±	Cinc.	1 n
1878.6	145.5	0.57	β	1
1879.8	156.6	0.6 ±	Cinc.	1
1886.7	146.4	0.48	L. McC.	2

No. 12. β 715. Lal. 45,490. 6.3
23h 9m 27s — 11° 13′.9.

Comes = 11.0

1877.7	253°.4	3″.38	β	2 n
1878.7	257.6	3.32	„	3–2
1890.7	256.9	3.50	„	3

Other measures.
"Large star, single":— β
„ „ :—L. McC.
It had been measured at Cinc. in 1877 as a close pair.

No. 13. Innes 143. Lac. 9405. 7.2
23h 9m 36s — 60° 14′.3.

Comes = 10.5

1896.7	5°. ±	2″.5 ±	Innes	1 n

No. 14. λ 480. C. Z. 23 h. 230. MAG. 9.0
23h 9m 53s — 36° 15′.4.

9.7 and 9.9

1896.7	291°.9	0″.56	See	2 n

No. 15. β 716. Anon. 9.0
23h 10m 17s — 9° 37′.0.

9.4 and 10.2

1877.6	208°.7	1″.70	β	2–1 n
1891.9	204.1	1.79	„	3

In the field with the triple system of ψ_1 Aquarii; see next star.

No. 16. β 1220. Lal. 45,523. 9.4
23h 10m 36s —9° 37′.4.

10.1 and 10.2

1889.69	267°.1	0″.14	β	1 n
1890.63	271.1*	0.22	„	3–4
1891.57	274.3	0.22	„	4
1894.66	279.1*	0.28	Barnard	5

This most difficult pair is 49½″ N.pr. ψ_1 Aquarii, mag. 4.5, with which it is proceeding through space at the rate of 0″.350 towards 89°.8. Another of the many examples in which the connection is demonstrated by the p.m. alone, as the angle and distance between these stars has not varied appreciably for 100 years:—

1782.5	314°.7	.....	♅	1 n
1836.7	312.2	49.6	Σ	4
1851.9	312.8	49.4	W. Struve	1
1878.8	311.8	49.7	Doubiago	4

No. 17. λ 481. Ö.A. 22,716. 8.8
23h 11m 1s — 26° 54′.7.

9.5 and 9.6

1897.7	140°.4	3″.12	See	1 n

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MAG.

No. 18. β 182. W.B. 23 h. 175. 8.2
23h 11m 54s — 14° 21′.9.

8.9 and 9.0

1876.3	42°.3	0″.83	Dembowski	4–3 n
1877.8	48.5	0.8 ±	Cinc.	1
1879.7	43.7	0.78	„	1
1886.8	43.1	0.85	L. McC.	3
1888.8	45.4*	0.74	Haverford	2
1891.6	48.8	0.63	β	3

No certain change, yet a common p.m. of 1″.331 towards 202°.5.

No. 19. β 79. Lal. 45,585. 8.1
23h 12m 26s — 2° 3′.8.

8.6 and 9.2

1872.8	120°. ±	1″. ±	β	1 n
1875.9	116.8	1.02	Dembowski	3
1877.8	114.3	0.9 ±	Cinc.	1
1877.8	111.1	1.06	Dembowski	1
1879.6	109.2	0.75	Cinc.	2
1886.6	102.4	1.02	L. McC.	2
1891.5	94.6	0.88	β	3
1893.5	87.7	0.86	Goodsell	1
1894.7	90.7	1.01	Barnard	4
1897.7	86.4	0.98	Aitken	3

A binary pair, the period being in all probability under 200 years.

Common p.m. of 0″.212 towards 119°.7.

Prof. Barnard also measures a 16.5 mag. star, 157°, 16″.

Σ 2995, two 8th mag. stars, 5″ apart, is S.pr.

No. 20. h. 5392. Bris. 7270. 8.5
23h 12m 44s — 58° 50′.9.

C. Z. 23 h. 305. = 9.5

1834.8	19°.4	8″. ±	*h* (mirror)	1 n
1835.9	19.7	6.96	„ (refractor)	1
1836.8	16.5	12. ±	„ (mirror)	1
1873.8	343.7	14.92	C. Z.	1
1879.4	335.7	16.87	C. G. A.	4
1880.9	337.1	15.58	Russell	1

The change can be roughly accounted for by a p.m. of 0″.26 towards 132° in the chief star. It is not, however, borne out by the somewhat scanty meridian observations of the brighter component, and the moving star may be the fainter one.

Both stars are in the C. P. D., mags. 7.8 and 8.5.

MAG.

In the field with γ Toucani, mag. 4.0.

Mr Russell's measure is recorded in his list of new pairs, this being = Russell 343.

No. 21. Hough 199. ψ_3 Aquarii. 5.1
23h 13m 46s — 10° 9′.4.

Comes = 11.7

1884.9	223°.5	1″.15	Hough	1 n
1888.7	222.8	1.22	β	3
1889.9	222.7	.....	Hough	1
1890.6	218.6	1.15	β	2–3

The p.m. is small.

No. 22. ♅. III. 34. 94 Aquarii. 5.2
23h 13m 51s — 14° 0′.2.

Piazzi 23 h. 41 = 7.8.

1802.7	342°.8	″	♅	1 n
1830.9	345.2	13.4	Σ	3
1853.0	345.6	13.6	Jacob	4
1858.1	344.8	13.7	Dembowski	2
1867.5	346.3	13.6	„	4
1876.8	347.7	13.5	Cinc.	5
1887.9	346.6	13.5	Hall	2
1892.8	346.1	12.7	Glasenapp	2

Relatively fixed, but common p.m. of 0″.284 towards 109°.3.

Other measures.

Equal to Σ 2998 and South and *h* 354.

No. 23. Cordoba [65]. C. Z. 23 h. 349. 8.7
23h 14m 12s — 37° 13′.0.

9.2 and 9.7

1896.7	57°.5	1″.71	See	2 n

Discovered in 1872 = Class I.

No. 24. h. 5394. 96 Aquarii. 5.7
23h 14m 13s — 5° 40′.2.

Comes = 11.0

1836.7	26°.3	10″. ±	*h*	1 n
1869.8	23.5	9.9	Dembowski	3
1878.6	23.1	10.1	β	1
1896.8	21.3	10.6	Leavenworth	3
1896.9	21.7	10.6	Hussey	2
1896.9	19.9	10.2	Aitken	2

The p.m. of the chief star is 0″.166 towards 89°.3 in which the *comes* would seem to share.

Other measures.

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No. 25. Dunlop 248. Lac. 9446. MAG. 6.0
23h 15m 13s — 50° 51′.1.

6.3 and 7.5

1836.9	211°.5	16″.9	*h*	3 n
1871.9	210.0	16.1	Russell	1
1879.9	209.8	16.4	Hargrave	1

The p.m. is very small.

Called *h* 5394 by Mr Russell in error; see preceding pair.

No. 26. h. 5395. C. Z. 23 h. 383. 7.9
23h 15m 32s — 38° 14′.1.

8.0 and 10.5

1834.7	221°.3	3″.±	*h*	1 n
1835.8	222.1	3.±	,,	2
1856.9	226.1	3.13	Jacob	2–1
1880.9	231.2	2.57	Hargrave	1
1896.9	225.4	3.60	Sellors	3–2

Change doubtful.

No. 27. h. 3184. Lal. 45,704. 7.3
23h 15m 40s — 19° 5′.4.

7.5 and 9.3

1831.±	281°.7	6″.±	*h*	1 n
1877.8	282.1	5.56	Cinc.	3
1877.8	279.3	4.85	Schiaparelli	2
1892.7	282.3	5.18	Glasenapp	2

Fixed.

No. 28. Dunlop 249. Lac. 9455. 5.9
23h 18m 15s — 54° 21′.4.

6.2 and 7.5

1835.2	213°.5	27″.1	*h*	2 n
1877.9	211.9	26.3	Melbourne	1
1880.9	211.2	25.8	Russell	1

In the Sydney list of new double stars = Russell 344.

Both stars have been observed on the meridian by Brisbane and others, and they are recorded separately in the C. P. D., mags. 6.4 and 6.8.

No. 29. H. N. 112. Mayer 993. MAG. 7.2
23h 18m 34s — 9° 0′.5.

7.6 and 8.6

1795.8	pr.	Class III.	H	1 n
1824.8	274°.1	7″.98	South	–
1830.9	273.3	7.54	Σ	3
1859.9	263.9	5.58	Morton	2
1866.2	262.2	5.34	Dembowski	5
1877.7	255.9	4.90	Cinc.	3
1884.9	252.3	4.64	Hall	2
1892.8	246.0	3.72	Glasenapp	2

H's Dec. was in error 10°.

Also recorded as South 829 and Σ 3008, and separately observed on the meridian by Bessel and others.

Probably a case of rectilinear motion in the chief star.

Other measures.

See also note by Auwers on page 197 of his *Tobias Mayer's Sternverzeichniss.* The p.m. there given will not quite account for the change shewn.

No. 30. Howe. Lal. 45,803. 7.6
23h 18m 42s — 27° 49′.8.

Comes = 10.7

1877.7	267°.0	6″.27	Cinc.	2–1 n
1897.3	267.6	6.62	Lowell	5

Identified by Prof. See as Lal. 45816, which is about 10′ S.f. the above position.

No 31 Innes 144. Lac. 9467. 8.2
23h 20m 13s — 43° 26′.9.

8.6 and 9.6

1896.8	5°.±	0″.9 ±	Innes	1 n

No. 32. λ 483. C.P.D.—36°, 9,742 9.3
23h 20m 43s — 36° 22′.0.

9.8 and 10.3

1896.8	294°.7	1″.17	See	2 n

This is the nearest star in the Cor. D. M. or the C. P. D. to Prof. See's position.

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No. 33. λ 484. Ö.A. 22,832. MAG. 8.8
23h 20m 44s — 23° 4′.1.

8.9 and 11.6

1897.7	52°.6	1″.25	See	1 n

Prof. See also measures a 12.8 mag. star 23″ S.f.
λ 486 is 4m f., 10′ S. It is a similar triple and the measures agree with those of the above pair within their probable errors.

No. 34. Harvard 176. B.D.—22°, 6127. 8.8
23h 20m 59s — 21° 58′.9.

9.3 and 9.8

1868.8	48°.9	4″.45	Harvard	1 n
1879.9	51.7	7.±	Cinc.	1
1896.8	52.4	4.61	See	2

Prof. See's R.A. and Dec. are a little different from those adopted above.

No. 35. λ 485. Piazzi 23 h. 82. 6.5
23h 21m 19s — 22° 17′.4.

Comes = 12.3

1897.7	130°.9	5″.60	See	1 n

No. 36. Ormond Stone. Lal. 45,914. 8.1
23h 22m 27s — 27° 13′.7.

8.7 and 9.1

1876.8	218°.2	1″.64	Cinc.	1 n
1877.8	218.0	1.55	„	2
1884.9	218.5	1.47	„	1
1885.7	220.7	1.43	„	1
1897.6	218.2	1.76	See	1

There is a wide pair 27′ S.pr.

No. 37. Innes 23. Lac. 9481. 7.0
23h 22m 34s — 56° 59′.1.

7.2 and 9.2

1895.8	325°.±	0″.9 ±	Innes	3 n

No. 38. Innes 145. C. Z. 23 h. 644. MAG. 8.7
23h 25m 20s — 58° 39′.8.

9.0 and 10.3

1896.9	80°.±	1″.3 ±	Innes	1 n

C. Z. 23 h. 655, mag. 8.5, is 21 secs. f. 6′ S.

No. 39. Cordoba [66]. Cape 1880, 12,192. 8.0
23h 27m 52s — 57° 34′.9.

8.5 and 9.1

1874.9	215°.9	2″.59	C. G. A.	1 n
1895.9	207.5	1.95	Sellors	3

Lac. 9512, mag. 7.2, is about 90″ S.f.

No. 40. Innes 25. C. Z. 23 h. 766. 7.5
23h 29m 47s — 58° 2′.8.

8.1 and 8.5

1895.9	57°.1*	1″.18	Sellors	3 n

After careful scrutiny in 1896, 180° has been added to the position angle.
The pr. star of an elongated cross in the finder.

No. 41. β 81. Lal. 46,187. 8.0
23h 30m 3s — 12° 7′.9.

8.1 and 10.8

1876.1	10°.5	1″.53	Dembowski	3 n
1877.8	16.4	1.93	Cinc.	2
1886.4	13.4	1.96	L. McC.	2–3

No. 42. λ 492. Lac. 9527. 6.5
23h 30m 24s — 28° 2′.3.

6.7 and 8.6

1897.8	265°.1	0″.38	See	1 n

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No. 43. β 721. Lal. 46,243. MAG. 7.8
23h 31m 8s — 7° 40′.2.

8.5 and 8.6

1878.2	138.2	0.51	β	2–1 n
1879.2	145.5	0.44 ±	Cinc.	2
1886.8	134.6	0.38	L. McC.	2

No. 44. Howe. Lac. 9534. 6.5
23h 31m 48s — 32° 25′.5.

6.6 and 9.5

1877.8	250.2	5.50	Cinc.	1 n
1881.4	251.0	5.35	β	4–3
1885.8	253.1	5.16	Cinc.	2
1886.9	248.0	5.60	Pollock	2
1896.8	251.3	5.38	See	2

Also found independently as β 775, and β 1012.

No. 45. h. 3206. Ö.A. 22,939. 8.1
23h 31m 49s — 22° 13′.6.

8.6 and 9.3

1831. ±	352.9	2. ±	h	1 n
1877.8	349.3	3.14	Cinc.	2
1886.9	348.3	3.44	L. McC.	4–3

No. 46. λ 493. Ö.A. 22,947. 8.6
23h 32m 55s — 25° 46′.4.

A = 8.6 B = 11.0 C = 11.0

A and B + C

1897.8	206.4	36.46	See	1 n

B and C

1897.8	262.8	1.75	See	1 n

No. 47. Russell 348. C. Z. 23 h. 884. 8.2
23h 33m 53s — 69° 44′.8.

8.6 greenish and 9.6 yellow

1870.9	350.3	4.16	Russell	1 n
1890.8	349.2	4.82	Sydney	4

No. 48. Dunlop 251. θ Phœnicis. MAG. 6.2
23h 34m 6s — 47° 11′.6.

6.6 and 7.6

1835.4	268.8	4.47	h	3 n
1851.8	269.5	4.08	Jacob	3
1852.8	270.0	4.00	„	4
1856.9	270.6	4.18	„	3
1873.8	271.2	4.75	Russell	1
1877.9	271.4	4.36	Melbourne	1
1879.7	271.2	3.39	β	2
1887.7	270.0	4.30	Pollock	2
1895.8	273.1	.....	Doberck	4

Virtually fixed.

Mr Russell calls this double h 5411, but erroneously so.

No. 49. β 723. Lal. 46,375. 7.5
23h 35m 33s — 0° 8′.3.

Comes = 11.7

1877.8	169.5	3.96	β	2 n
1878.7	167.4	3.60	„	2
1891.8	167.8	3.66	„	3

No. 50. Σ 3030. Göttingen 6492. 8.2.
23h 35m 35s — 0° 56′.2.

8.9 and 9.1

1829.6	220.8	2.49	Σ	4 n
1866.1	224.0	2.57	Dembowski	3
1877.8	222.5	2.47	Cinc.	4
1886.8	222.5	2.53	L. McC.	3

No. 51. λ 494. C. Z. 23 h. 957. 8.9
23h 36m 14s — 34° 44′.8.

9.2 and 10.4

1896.7	211.6	0.74	See	2–1 n

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No. 52. β 279. ω_2 Aquarii. MAG. 4.7
23h 37m 32s — 15° 5′.9.

Comes = 10.7

	°	″		
1875.5	87.8	5.68	Dembowski	4 n
1877.8	84.5	5.59	Cinc.	3
1888.7	83.3	5.86	β	3
1888.9	85.4	5.11	Haverford	2–1

The p.m. of the chief star is 0″.094 towards 125°.6, in which the companion seems to participate.

Considered a test for a 4 or 4½-inch refractor.

No. 53. h. 5414. C. Z. 23 h. 981. 8.8
23h 37m 36s — 78° 21′.8.

Comes = 10.3

	°	″		
1835.7	262.1	8. ±	h	1 n
1870.8	261.9	8.32	Russell	1
1880.9	261.3	6.64	Hargrave	1

No. 54. β 725. Piazzi 23 h. 161. 7.4
23h 37m 38s — 11° 52′.9.

Comes = 10.7

	°	″		
1877.8	237.3	4.32	β	2 n
1877.8	245.3	4.46	Cinc.	1
1891.9	241.1	4.12	β	3

No. 55. h. 5417. Piazzi 23 h. 167. 6.3
23h 39m 17s — 26° 48′.1.

Comes = 9.5

	°	″		
1836.7	326.9	8. ±	h	1 n
1876.8	321.4	8.45	Cinc.	1
1877.8	319.4	9.07	,,	2
1897.1	319.7	8.91	See	3

No. 56. Cordoba [67]. C. Z. 23 h. 1041. 9.0
23h 39m 29s — 45° 48′.1.

Comes = 9.7

	°	″		
1897.8	306.1	4.32	See	1 n

Prof. See also measures a 12th mag. star 24″ N.

S.f. Lac. 9574, mag. 6.4, and near Lac. 9587, mag. 7.5.

No. 57. H. II. 24. i_2 Aquarii. MAG. 5.4
23h 40m 49s — 19° 14′.1.

5.6 and 7.2

	°	″		
1821.9	143.4	.....	Σ	1 n
1845.8	140.5	5.78	Jacob	1
1855.9	140.7	5.68	Secchi	3
1876.3	140.0	6.34	Cinc.	4–2
1892.9	139.9	5.48	Glasenapp	2
1895.8	139.7	5.73	Doberck	4
1897.8	137.2	6.17	See	1
1898.9	134.6	5.86	Solá	1

Common p.m. of 0″.087 towards 54°.2.

Also recorded as South and h 356.

Other measures.

No. 58. Σ 3036. Piazzi 23 h. 179. 8.2
23h 40m 53s — 0° 17′.5.

8.3 and 10.9

	°	″		
1832.5	228.2	2.42	Σ	3 n
1847.7	227.5	2.70	Mitchel	1
1869.0	230.2	2.76	Dembowski	4
1877.9	227.9	2.38	β	1
1886.8	227.4	2.58	L. McC.	3–2
1892.8	233.2	2.50	Glasenapp	2

Fixed.

Other measures.

No. 59. β 726. B. D.—13°, 6461. 8.5
23h 41m 25s — 13° 18′.7.

8.7 and 10.7

	°	″		
1877.9	324.2	0.91	β	1 n
1879.8	326.6	0.77 ±	Cinc.	3
1886.9	324.5	0.68	L. McC.	3–2

No. 60. Cordoba [68]. C. Z. 23 h. 1109. 8.1
23h 42m 10s — 61° 4′.5.

8.5 and 9.5

	°	″		
1880.8	119.2	4.30	C. G. A.	3 n

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No. 61. Innes 305. Lac. 9598. MAG. 6.9
23h 42m 50s — 51° 26′.7.

Comes = 11.0

1897.9	140°. ±	3″. ±	Innes	1 n

A 10th mag. star is some way N.pr.

No. 62. β 1013. δ Sculptoris. 4.6
23h 43m 43s — 28° 41′.0.

Comes = 11.0

1881.9	228°.2	3″.36	β	2 n
1891.6	228.9	3.34	„	2

(Seen, 1896.8).

Common p.m. of 0″.123 towards 154°.6.

An 8.9 mag. star, 74″ away, constitutes with the chief star, the old pair *h* 3216.

No. 63. Sellors 14. Lac. 9612. 7.2
23h 45m 17s — 52° 15′.5.

7.8 and 8.1

1891.9	70°.4	0″.90	Sellors	1 n
1895.9	64.1	1.28	„	2

No. 64. λ 495. C. Z. 23 h. 1205. 8.5
23h 45m 44s — 34° 7′.1.

8.7 and 10.6

1896.7	16°.5	2″.34	See	2 n

No. 65. Lalande 192. Lac. 9639. 6.4
23h 49m 11s — 27° 36′.0.

6.9 and 7.4

1851.9	269°.1	6″.66	Jacob	2 n
1876.8	267.7	7.10	Cinc.	2
1892.8	266.7	6.13	Glasenapp	2

In the C. G. A. (where both stars' co-ordinates are given) the order of brightness is reversed.

Also called Dunlop 253.

Other measures.

Lac. 9639 was formerly called φ Sculptoris.

No. 66. Innes 146. Lac. 9641. MAG. 7.3
23h 49m 54s — 37° 55′.2.

7.8 and 8.3

1897.3	222°. ±	0″.73 ±	Innes	2 n

Two faint stars pr.

No. 67. Σ 3046. Lal. 46,916. 8.3
23h 51m 15s — 10° 3′.3.

8.8 and 9.3

1830.1	232°.2	2″.52	Σ	4 n
1863.9	241.0	2.90	Dembowski	2
1875.3	244.8	2.83	„	2
1877.9	243.0	3.03	Cinc.	3
1877.9	244.8	3.05	β	1
1892.9	246.0	2.92	Glasenapp	2

Other measures.

Common p.m. of 0″.352 towards 248°.5.

The p.m. in the *Handbook of Double Stars* is erroneous.

No. 68. β 730. 27 Piscium. 5.0
23h 53m 33s — 4° 6′.6.

Comes = 11.0

1877.9	264°.9	1″.44	β	1 n
1879.0	265.2	1.49	„	5
1879.1	264.0	1.40	Cinc.	2
1886.9	269.1	1.78	L. McC.	3–2
1889.6	267.4	1.50	β	3

Common p.m. of 0″.094 towards 232°.7.

No. 69. β 731. Lal. 47,033. 8.0
23h 54m 29s — 8° 21′.6.

8.3 and 9.4

1878.3	257°.8	1″.57	β	2 n
1886.8	262.0	1.67	L. McC.	4
1888.8	262.1	1.36	Haverford	2

No. 70. λ 499. Lac. 9685. 8.1
23h 55m 4s — 40° 44′.9.

8.6 and 9.1.

1897.7	270°.3	0″.72	See	2–1 n

No. 68. The means of 1879.0 include the previous measure of 1877.9.

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No. 71. Gilliss 289. C. Z. 23 h. 1475. MAG. 8.0
23h 55m 25s — 67° 14′.3.

8.3 and 9.4

	°	″		
1889.8	262.7	3.65	Pollock	2 n
1891.9	261.9	3.80	Sellors	1

Separately observed on the meridian at Cordoba.

No. 72. h. 5437. Lac. 9686. 6.7
23h 55m 25s — 53° 39′.2.

Comes = 10.2

	°	″		
1836.0	295.6	2.5 ±	*h*	2 n
1852.9	292.5	2.89	Jacob	3–2
1857.9	292.1	2.63	„	2–1
1870.7	Not seen		Russell	1
1880.6	295.7	2.10	Cruls	1
1891.8	293.0	2.04	Sellors	1

No. 73. h. 5440. Lal. 47,124. MAG. 7.8
23h 57m 8s — 27° 41′.4.

8.4 and 8.8

	°	″		
1834.8	285.1	3.63	*h*	1 n
1851.9	287.0	3.58	Jacob	2
1885.8	287.0	3.52	Cinc.	2

Other measures.

No. 74. Cordoba [69]. C. Z. 23 h. 1574. 8.5
23h 58m 51s — 48° 40′.9.

Comes = 9.9

	°	″		
1887·8	68.0	2.64	Pollock	3–2 n

C.P.D. mag. = 7.4.

No. 75. λ 500. Yarnall$_3$ 10,936. 8.5
23h 59m 45s — 33° 2′.8.

8.6 and 11.7

	°	″		
1896.7	203.0	0.92	See	2 n

Lac. 9714, mag. 7.0, is 20 secs. f.

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LIST OF REJECTED STARS.

This list consists of stars rejected for the reasons given in the last column.

Authority or Discoverer.	Star.	Mag.	1900. R. A.	1900. Dec.	Original Record.	Remarks.
			h m	° ′		
Wilson, H. C.			0 48	−18 12	1885, 115°, 0″.3.	Identification too uncertain.
C. G. A.	C. Z. 0 h 1280.		0 50	−45 46	1880, Duplex, I. M.O.	No confirmation.
Cordoba Z. C.	Lac. 408.	7.2	1 23	−27 38	1873, Duplex, I.S. M.O.	No confirmation.
Cape 1880, Catalogue.	Lac. 590.	6.3	1 53	−61 21	1875, Double. M.O.	No confirmation.
Harvard Circular, 18.	Lac. 896.	5.6	2 43	−64 7	Within 30″.	Too wide. 1898.0, a 10.7 star 20″ f. being the nearest *comes*.
Cincinnati.		6.8	5 28	− 1 47	1885, 153°, 2″.7.	Co-ordinates in error, no such pair here. See Σ 734.
h 3839.			6 9	−18 17	1835, Double?	1897, no pair here.
h 383.			6 10	− 2 40	1827, faint pair 2″.	Might be = B. D. − 2°, 1526, mag. 9.6. Too faint.
Hargrave.			6 25	−75 23	1883, 55°, 2″.9, 8^m and 9^m.	Identification too uncertain.
C. G. A.	Lal. 14,706.	6.2	7 27	− 8 40	Double.	The p.m. is 0″.17 towards 206°.
C. G. A.	Lac. 2920.	7.2	7 36	−48 49	1876.2 S. pr.	No confirmation.
Harvard 114.			8 6	−23 55	1870, 333°, 2″, 8.5^m and 10^m.	No suitable star here.
h 4058.	*r* Puppis.	5.3	8 10	−35 36	1838, 190°, 4″, 5.7^m and 6.6^m.	Single.
Harvard 118.			8 11	−24 30	1869, 1″.5, both 9.5^m.	No suitable star near.
Cordoba Z. C.	Lac. 3624.	8.0	8 54	−50 39	1875.4. Dpl.	1896 certainly single. 1897 single.
h 4211.	ζ Octantis.	5.5	9 11	−85 16	*h*:—"Doubtful."	Russell:—Not divided.
Russell 127.			9 33	−48 34	1880. Triple 2″ and 13″.	No star here, 1894 and 1896.
Cape 1880, Catalogue.	Lac. 3967.	7.5 Red.	9 36	−30 28	1878. Close double.	1897, single.
Russell 142.			10 19	−64 46	1880, 354°, 3″.4.	No star here, C. Z. 10^h 1352 26′ S. is double. See Catalogue.
h 4336.	Cor. D. M. − 29°, 8466.	9.2	10 32	−29 59	1834, 1″.5, 9.6 and 10.6. Requires verifying.	No confirmation.
C. G. A.	η Argûs cluster Nos. 166–7.	8.7	10 43	−59 34	Both 9.5, 2″.3.	Probably the same star. Prof. See in measuring an 11.5 *comes* at 16″.8 makes no mention of a closer companion (*M. N. R. A. S.*, vol. lvii. p. 346).
Alvan Clark 6.		6.0	12 4	−19 49	1852.	No such bright star here.
h 4527.			12 28	−23 17	1834, 94°, 2″ both 9.7^m.	No pair here.
Cape 1880, Catalogue.	Lac. 5471.	7.7	13 12	−43 33	1877. Close Double.	1897. Under 0″.5 if double, which is doubtful.
Cordoba Z. C.	*z* Centauri.	5.2	13 41	−35 45	1874. Dpl.	No confirmation.
h 4628.	ζ Centauri.	2.8	13 49	−46 48	Suspected *comes* at 6″.	No confirmation.
h 4694.	4 Libræ.	5.8	14 38	−24 34	1836.3, 45°, close, very unequal, strongly suspected.	No confirmation.
Cincinnati.			15 31	−20 1	1884, 100°, 1″.5, both 10^m.	Identification too uncertain.

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REJECTED STARS—*continued.*

Authority. or Discoverer.	Star.	Mag.	1900. R. A.	1900. Dec.	Original Record.	Remarks.
			h m	° ′		
Howe.		8.0	15 39	−20 40	1883, 200°, 2″.7, 8.2^m and 9.7^m.	No star = 8^m in this position.
Harvard 141.			16 3	−30 45	1868, 353°, 4.″2.	Identification too uncertain.
Harvard Circular, 18.	Lac. 6793.	6.5	16 15	−43 40		1897. 25″. Too wide.
h 4864.	B.D. −6°, 4457.	9.6	16 28	− 6 22	1835. Class I., 9.7^m and 12^m.	No confirmation.
h 4865.	Gilliss P. Z. 11,951.	10	16 41	−83 56	1835, 314°, 2″, 10^m and 11^m.	No close companion :—Russell.
Innes 103.	C. Z. 17 h 480	8.0	17 9	−33 43		Not verified.
h 4975.	Lac. 7413.	6.4	17 40	−35 22	*h*—: "dubious."	Single on 7 nights, Sydney and Melbourne.
Cordoba Z. C.	C. Z. 18 h 2002.	9.0	18 37	−54 0	1874. Class I.	See 18 hrs., No. 74 in catalogue.
O. Stone.			19 22	−16 8	1880.6, 195°, 5″, 6.8^m and 7.3^m, 2 nights.	No such bright star hereabouts.
O. Stone.			19 42	−22 4	1879.5, 316°, 3″, 7.8 and 11. Measured as Cinc. O. S. 1734.	Perhaps equal to Cinc. O. S. 1735?
Cape 1880, Catalogue.	Lac. 8469.	7.2	20 33	−72 17	1874. Double.	1896.9. Not double.
Gilliss 266.	α Octantis.	5.3	20 53	−77 24	1851, 302°, 1″.9 *comes* 10^m.	1897. Single. The p.m. is 0″.37 towards 184°.
Dembowski.	14 Aquarii.		21 11	− 9 38	1876, 147°, 0″.5, 7.2^m and 7.3, 4 n.	Single: β. Dembowski retained a doubt as to the duplicity.
Cincinnati.			21 46	−23 25	1883, 340°, 0″.5, both 7.5.	No bright star here.
β 768.	Piazzi 21 h 324.	5.7	21 50	−37 44		Practically rejected by β.
Cincinnati.			22 39	−22 8	1883, 20°, 1″ 8^m and 9.5^m.	No star of that magnitude here. Position too rough for identification.

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INDEXES TO STARS CONTAINED IN THE CATALOGUE.

THE following indexes have been added to facilitate the identification of stars when the names only are known, and not the places for 1900·0.

The first index contains the constellation-named stars; this is followed by indexes of the stars occurring in the lists of the Herschels, the Struves, Burnham, and of other discoverers of double stars.

In many cases the notes appended to the measures contain references to stars not necessarily double; these stars, if constellation-named, are also indexed; but they are distinguished in the index by having, in place of the right ascension, a reference to the double star in the notes to which they are mentioned.

In a similar way, when a double star is known by various synonyms these are usually all indexed, but reference is then made to the chief name of the double star, and the right ascension will be found under this name in the proper index.

In all the indexes the completed minute of the right ascension is given, this being more useful than the nearest minute for the purposes of an index.

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INDEX TO CONSTELLATION-NAMED STARS.

(The R.A. is given to the nearest *completed* minute.)

Constellation.	R.A.
Antlia	
δ	$10^h\ 24^m$
ζ_1	9 26
Apus	
β	$16^h\ 28^m$
ι	See Innes 104
κ_2	$15^h\ 29^m$
Aquarius	
β	See β 72
ζ	$22^h\ 23^m$
	see also β 76
	and β 1264
o	See Hough 469
ψ_1	β 1220 and β 716
ψ_3	$23^h\ 13^m$
ω_2	23 37
e	See Leavenworth
	($22^h\ 5^m$)
f	22 21
i_2	23 40
4	20 46
7	20 51
12	20 58
14	See Rej. Stars
18	See β 272
19	See Hough 158
24	$21^h\ 34^m$
29	21 56
35	See β 170
41	$22^h\ 8^m$
51	22 18
60	See β 77
94	$23^h\ 13^m$
96	23 14
Aquila	
e	See Hough 106
5	$18^h\ 41^m$
Ara	
γ	$17^h\ 16^m$
ϵ_2	16 55
ι	17 15
κ	17 18
λ	See Innes 106
ν_1	See h 4978
Argo	
α	$6^h\ 21^m$
γ	8 6

Constellation.	R.A.
Argo—*contd.*	
δ	$8^h\ 41^m$
ζ	See Innes 164
η	See Rej. Stars
	and h 4356
κ	See β 1061
λ	$9^h\ 4^m$
μ	10 42
ξ	7 45
π	See Jacob [4]
σ	$7^h\ 26^m$
υ	9 44
ψ	9 26
Cælum	
α	$4^h\ 37^m$
γ	5 0
Canis major	
α	$6^h\ 40^m$
	see also β 20
ϵ	$6^h\ 54^m$
λ	See β 753
μ	$6^h\ 51^m$
τ	7 14
12	O. Stone ($6^h\ 42^m$)
Capricornus	
α_2	$20^h\ 12^m$
β	Barnard ($20^h 15^m$)
ζ	$21^h\ 20^m$
π	20 21
ρ	20 23
41	21 36
Carina	
l	See Innes 203
p	See Innes 32
t_2	$10^h\ 34^m$
y	11 8
C	8 13
H	See Innes 201
Centaurus	
α	$14^h\ 32^m$
γ	12 36
δ	12 3
	see also Innes
	216
η	$14^h\ 29^m$
ζ	See Rej. Stars,
	also Dunlop 141
θ	$14^h\ 0^m$

Constellation.	R.A.
Centaurus—*cont.*	
κ	See Innes 237
μ	$13^h\ 43^m$
ξ_2	13 1
o_1	11 27
o_2	See o_1
ψ	$14^h\ 14^m$
d	13 25
f	13 0
h	13 47
k	13 46
x	12 20
y	13 47
z	See Rej. Stars
D	$12^h\ 8^m$
F	12 13
G	12 21
J	13 16
M	13 40
N	13 45
Q	13 35
R	14 9
Cetus	
ζ	See β 1168
χ	"
12	$0^h\ 24^m$
13	0 30
37	1 9
42	1 14
58	1 52
66	2 7
84	2 36
94	3 7
95	3 13
	see also β 1177
Chamæleon	
δ_1	$10^h\ 44^m$
δ_2	See δ_1
ϵ	$11^h\ 54^m$
Circinus	
α	$14^h\ 34^m$
γ	15 15
δ	15 8
κ	See h 4813
Columba	
α	$5^h\ 36^m$

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CONSTELLATION-NAMED STARS—*continued.*

Constellation.	R.A.
Corona Australis	
γ	$18^h\ 59^m$
κ	18 26
λ	18 36
Corvus	
δ	$12^h\ 24^m$
ζ	12 15
Crater	
γ	$11^h\ 19^m$
ϵ	See β 26
Crux	
α	$12^h\ 21^m$
η	12 1
ι	12 39
κ	See Harvard ($12^h\ 47^m$)
μ	$12^h\ 48^m$
Eridanus	
ϵ	$3^h\ 28^m$ and Dunlop 156
θ	$2^h\ 54^m$
ι	See Innes 53
o_2	$4^h\ 10^m$
ρ_2	2 57
τ_4	3 15
υ_4	4 14
χ	1 52
ω	See β 316
f	$3^h\ 44^m$
p	1 35
w	3 49
A	4 9
X	4 14
12	See h 3555
15	$3^h\ 13^m$
30	3 47
32	See H. II. 36
46	$4^h\ 29^m$
53	See β 185
54	See Howe 6
55	$4^h\ 38^m$
Fornax	
α	$3^h\ 7^m$
γ_1	2 45
γ_2	2 45
η_2	2 46
η_3	See h 3536
ν	See h 3532
χ_3	$3^h\ 24^m$
ω	2 29

Constellation.	R.A.
Grus	
β	See Cordoba [63]
η	$22^h\ 39^m$
θ	23 1
π_1	22 16
τ_2	See Innes 22
Hydra	
β	$11^h\ 47^m$
π	See β 938
ϕ_2	See β 1075
ϕ_3	"
l	$14^h\ 22^m$
m	14 40
N	11 27
15	8 46
17	8 50
29	9 22
59	14 52
U.A. 214	10 16
" 383	See H. III. 97
Indus	
α	$20^h\ 30^m$
η	See Innes 128
θ	$21^h\ 12^m$
Lepus	
α	$5^h\ 28^m$
β	5 23
γ	5 40
ι	5 7
κ	5 8
Libra	
η	See β 35
ι_2	See β 618
μ	$14^h\ 43^m$
ξ (51)	See ξ Scorpii
4	See Rej. Stars
5	$14^h\ 40^m$
48	See β 120
50	"
Lupus	
α	$14^h\ 35^m$
β	See h 4786
γ	$15^h\ 28^m$
ϵ	15 15
ζ	Washburn 121
η	$15^h\ 53^m$
κ	15 4
λ	15 2
μ	15 11
ξ	15 50
π	14 38

Constellation.	R.A.
Lupus—*contd.*	
ϕ_1	$15^h\ 15^m$
ψ_2	See λ 245
ω	$15^h\ 31^m$
a	14 30
b	14 40
d	15 29
f	See h 4788
k	See Innes 87
U.A. 103	$15^h\ 22^m$
Microscopium	
α	$20^h\ 43^m$
θ_2	21 18
ν	See Innes 127
R	See λ 423
Monoceros	
β	$6^h\ 23^m$
3	5 57
4	6 3
Musca	
β	$12^h\ 40^m$
ζ	12 16
θ	13 1
Norma	
γ_2	$16^h\ 12^m$
ϵ	16 19
	See also Innes 93
θ	$16^h\ 8^m$
ι_1	15 55
κ	16 5
λ	16 12
Octans	
α	See Rej. Stars
ζ	"
ι	$12^h\ 44^m$
λ	21 35
μ_2	20 29
Ophiuchus	
η	$17^h\ 4^m$
o	17 11
ρ	16 19
	see also β 624
	and β 1115
τ	$17^h\ 57^m$
ψ	See β 120
A	$17^h\ 9^m$
	see also β 956
24	$16^h\ 50^m$
38	17 11
U.A. 105	17 9

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CONSTELLATION-NAMED STARS—*continued.*

Constellation.	R.A.
Orion	
β	$5^h\ 9^m$
ϵ	See β 89
ζ	$5^h\ 35^m$
η	5 19
θ	5 30
θ_1	See β 1050
ι	$5^h\ 30^m$
σ	5 33
c	5 30
31	5 24
Pavo	
α	See Innes 126
ξ	$18^h\ 14^m$
Phœnix	
α	$0^h\ 21^m$
β	1 1
	and Sellors 2.
ζ	$1^h\ 4^m$
η	0 38
θ	23 34
κ	0 21
ξ	0 37
Pictor	
ι	$4^h\ 48^m$
μ	6 30
Pisces	
27	$23^h\ 53^m$
Piscis Australis	
α	$22^h\ 52^m$
β	22 25
γ	22 46
δ	22 50
η	21 55
θ	21 41
Puppis	
b	$7^h\ 49^m$
d_2	7 36
k	7 34
n	7 30
r	See Rej. Stars
v	See Jacob [4]
G	$6^h\ 23^m$
J	See Innes 286
K	See Dunlop 63
N	$7^h\ 54^m$
U	See β 332
Z	See Sellors 7

Constellation.	R.A.
Puppis—*cont.*	
2	$7^h\ 40^m$
5	7 43
9	7 47
19	8 6
21	See β 906
Reticulum	
α	See h 3641
ζ_2	See Innes 150
θ	$4^h\ 16^m$
Sagittarius	
β_1	$19^h\ 15^m$
δ	18 14
ϵ	18 17
ζ	18 56
η	18 10
κ_1	20 15
κ_2	20 17
μ	18 7
ν_1	See ν_2 Sagittarii
ν_2	$18^h\ 49^m$
f	See β 146
h_2	$19^h\ 30^m$
16	18 9
21	18 19
53	19 33
Scorpio	
α	$16^h\ 23^m$
β	15 59
ζ_1	16 46
θ	17 30
ι_1	See Innes 108
ι_2	$17^h\ 43^m$
ν	16 6
ξ	15 58
σ	16 15
ζ_1	16 6
ζ_2	See h 4839
k	$16^h\ 58^m$
A	15 47
11	16 2
Sculptor	
δ	$23^h\ 43^m$
ϵ	1 40
κ_1	0 4
τ	1 31
Serpens	
e	See Σ 2347

Constellation.	R.A.
Sextans	
γ	$9^h\ 47^m$
40	10 44
Telescopium	
ϵ	$18^h\ 3^m$
Toucan	
β	$0^h\ 26^m$
γ	See h 5392
δ	$22^h\ 20^m$
κ	1 12
	and Innes 27
λ_1	$0^h\ 48^m$
U.A. 64	0 40
Triang. Austr.	
δ	$16^h\ 6^m$
ι	16 18
T	15 0
Vela	
f	$8^h\ 47^m$
k	9 11
p	10 33
s	10 27
z	9 10
A	8 25
B	8 19
H	8 53
I	9 23
J	10 17
N	See Innes 31
T	See Rumker 13
Y	See h 4329
Virgo	
γ	$12^h\ 36^m$
	and β 607
θ	$13^h\ 4^m$
ψ	14 23
Y	See β 932
46	$12^h\ 55^m$
48	12 58
53	See β 221
54	$13^h\ 8^m$
81	13 32
86	13 40
	and β 935b
Volans	
α	See h 4167
γ	$7^h\ 9^m$
ϵ	8 7
ζ	7 43

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THE HERSCHELS' STARS.

♅. I.	
10	$6^h\ 23^m$
13	19 33
33	15 58
35	17 11
44	20 46
47	21 6
50	22 37
54	5 9
77	10 57
80	13 32
88	17 57
93	19 56
♅. II.	
7	C. Mayer ($22^h\ 23^m$)
17	$6^h\ 23^m$
19	16 19
20	15 58
24	23 40
26	5 30
33	5 9
36	3 49
42	12 51
45	13 8
51	20 23
57	22 42
63	7 32
74	See β 595
77	$8^h\ 50^m$
80	4 10
85	15 50
102	5 18
♅. III.	
1	See θ Orionis
7	$15^h\ 59^m$
12	5 30
18	See γ Virginis
25	$17^h\ 11^m$
27	7 34
33	18 41
34	23 13
50	13 4
67	5 7
96	11 27
97	14 40
99	4 38
101	13 46
111	See Σ 757
♅. IV.	
12	See β 1220
21	See ζ Orionis
25	$2^h\ 7^m$
26	See β 1064
76	Secchi ($0^h\ 29^m$)
87	See β 190
91	$7^h\ 40^m$

♅. IV.	
105	$12^h\ 24^m$
112	See β 601
121	$16^h\ 15^m$
♅. V.	
6	$16^h\ 6^m$
7	See h 2822
24	$1^h\ 9^m$
50	See γ Leporis
78	See ζ Sagittarii
95	$22^h\ 18^m$
119	See β 1049
120	See β 587
124	See Howe 25
♅. VI.	
44	See β 618
♅. N.	
9	See ♅. III. 33
19	$7^h\ 30^m$
24	4 9
26	See β 600
28	$14^h\ 51^m$
33	See Σ 3094
38	Lalande ($12^h\ 36^m$)
39	$16^h\ 18^m$
40	17 56
41	Bradley ($22^h\ 21^m$)
49	See A. Clark 5
50	$10^h\ 24^m$
51	13 47
56	22 8
69	13 31
80	See β 225
112	$23^h\ 18^m$
117	22 34
119	19 23
125	18 22
126	18 58
127	See α_2 Capricorni
128	See ♅. I. 50
129	$18^h\ 58^m$
133	See H. I. 50
138	$20^h\ 18^m$
139	21 16

h	
322	$0^h\ 24^m$
338	3 47
383	See Rejected Stars
596	$19^h\ 11^m$
608	20 12
663	3 7
840	11 19
921	See β 267
936	See β 72
1138	See Lalande 4

h	
1249	$14^h\ 11^m$
1381	See h 596
1537	$20^h\ 30^m$
1713	See Dunlop 141
1957	$0^h\ 16^m$
1964	0 20
1968	0 22
2004	0 52
2036	1 15
2043	1 17
2067	See h 2072
2072	$1^h\ 36^m$
2298	See β 1242
2435	See β 904
2692	$13^h\ 52^m$
2822	18 7
2843	See h 2847
2844	See h 2845
2845	$18^h\ 50^m$
2904	19 48
2948	Barnard ($20^h\ 15^m$)
2992	$20^h\ 38^m$
3003	20 47
3014	21 8
3074	21 53
3092	See β 170
3184	$23^h\ 15^m$
3206	23 31
3216	See β 1013
3362	$0^h\ 18^m$ and h 1964
3370	$0^h\ 23^m$
3373	See β Toucani
3375	$0^h\ 28^m$
3376	0 28
3385	0 36
3387	0 37
3391	0 38
3396	0 41
3407	See Dunlop 2
3415	$0^h\ 59^m$
3416	0 59
3417	See Sellors 1
3418	$1^h\ 1^m$
3423	1 12
3426	1 13
3429	Secchi ($1^h\ 18^m$)
3430	$1^h\ 16^m$
3447	1 31
3461	1 40
3464	1 39
3469	1 45
3473	1 52
3475	1 52
3485	2 7
3488	2 9
3494	2 15
3497	Harvard ($2^h\ 16^m$)
3506	$2^h\ 29^m$

h	
3527	$2^h\ 39^m$
3532	2 44
3534	2 44
3535	2 45
3536	2 46
3541	2 49
3545	Piazzi ($2^h\ 54^m$)
3549	$2^h\ 59^m$
3555	3 7
3556	3 8
3565	3 14
3576	3 21
3589	3 40
3592	3 42
3597	See Dunlop 16
3611	$3^h\ 53^m$
3641	4 13
3642	4 15
3644	See Rumker 3 and β 744
3646	$4^h\ 18^m$
3650	4 23
3672	4 34
3683	4 38
3694	See Innes 273
3696	$4^h\ 45^m$
3697	4 47
3699	4 47
3702	See Dunlop 18
3707	$4^h\ 51^m$
3715	4 56
3721	4 53
3724	See λ 45
3727	$5^h\ 6^m$
3728	5 5
3735	5 9
3739	5 10
3743	5 11
3746	5 11
3750	5 16
3752	5 17
3766	5 28
3768	5 26
3770	5 29
3783	See Innes 277
3784	$5^h\ 35^m$
3789	5 36
3799	5 44
3802	5 43
3807	5 48
3812	5 48
3823	5 56
3831	6 1
3834	6 1
3835	See Dunlop 23
3839	See Rejected Stars
3857	$6^h\ 20^m$
3858	6 22

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THE HERSCHELS' STARS—*continued.*

h		*h*		*h*		*h*	
3863	$6^h\ 25^m$	4191	$9^h\ 10^m$	4539	$12^h\ 36^m$	4752	See *h* 4753
3866	6 26	4193	9 11	4544	12 38	4753	$15^h\ 11^m$
3874	6 30	4196	9 13	4547	12 39	4755	15 12
3875	See β 755	4200	9 16	4555	See Dunlop 126	4756	15 13
3883	See Dunlop 31	4206	9 17	4556	$12^h\ 48^m$	4757	15 15
3891	$6^h\ 41^m$	4211	See Rejected Stars	4562	See Cape 13	4771	15 22
3896	See Innes 182	4213	$9^h\ 22^m$	4563	$12^h\ 55^m$	4773	15 25
3900	$6^h\ 50^m$	4218	9 29	4566	13 0	4774	See β 1114
3905	See Innes 66	4220	9 30	4567	13 0	4776	$15^h\ 23^m$
3928	$7^h\ 1^m$	4224	9 31	4568	See Dunlop 129	4777	15 24
3932	6 58	4249	9 44	4569	$13^h\ 1^m$	4780	15 30
3941	7 8	4252	9 44	4576	13 9	4786	15 28
3945	See Dunlop 42	4269	See Rumker 12	4579	13 14	4787	See *h* 4780
3948	$7^h\ 14^m$	4283	$10^h\ 0^m$	4580	13 17	4788	$15^h\ 29^m$
3949	7 14	4284	10 1	4586	13 21	4795	15 36
3950	See Lalande 53	4295	See Innes 13	4587	13 20	4799	See Rumker 20
3956	$7^h\ 18^m$	4303	See β 219	4596	13 30	4807	See Dunlop 193
3957	7 18	4306	$10^h\ 15^m$	4598	13 33	4809	See Sellors 11
3958	See Rumker 6	4310	10 10	4600	13 33	4813	$15^h\ 47^m$
3960	See *h* 3956	4311	10 18	4608	13 36	4815	See Dunlop 195
3964	See β 199	4321	See ♅. N. 50	4616	13 44	4825	$15^h\ 55^m$
3966	$7^h\ 21^m$	4329	$10^h\ 27^m$	4617	$13^h\ 45^m$ and	4828	15 57
3974	7 27	4336	See Rejected Stars		Rumker 18	4836	16 10
3996	7 27	4339	$10^h\ 35^m$	4626	$13^h\ 48^m$	4839	16 6
3997	7 37	4343	See Russell 152	4628	See Rejected Stars	4840	See *h* 4836
4000	7 40	4356	$10^h\ 40^m$	4630	$13^h\ 50^m$	4841	$16^h\ 12^m$
4009	See Dunlop 57	4360	10 40	4632	13 51	4843	16 15
4018	$7^h\ 50^m$	4373	10 44	4634	See Dunlop 151	4845	16 16
4023	7 51	4383	10 50	4636	$13^h\ 51^m$	4847	See Dunlop 201
4025	7 55	4393	10 53	4640	13 55	4848	$16^h\ 17^m$
4041	8 0	4409	11 2	4649	14 2	4850	See ♅. N. 39
4045	8 0	4414	11 8	4655	14 4	4853	$16^h\ 19^m$
4046	8 1	4421	11 11	4661	14 6	4854	16 21
4058	See Rejected Stars	4423	11 11	4667	14 13	4857	16 23
4073	$8^h\ 14^m$	4432	11 19	4671	14 17	4858	16 28
4077	See Gilliss 91	4439	See Dunlop 109	4672	14 13	4863	16 29
4084	$8^h\ 15^m$	4445	$11^h\ 27^m$	4685	14 28	4864	See Rejected Stars
4085	8 17	4455	11 31	4687	14 29	4865	
4087	8 18	4460	11 34	4690	14 30	4866	$16^h\ 31^m$
4093	8 22	4462	11 34	4693	See Dunlop 168	4874	16 34
4104	8 25	4463	See *h* 4455	4694	See Rejected Stars	4876	16 33
4106	8 26	4465	$11^h\ 36^m$	4696	$14^h\ 39^m$	4885	16 40
4107	8 27	4475	11 43	4698	14 40	4889	16 44
4125	8 35	4478	11 47	4706	14 44	4892	16 47
4128	8 37	4480	11 49	4707	14 45	4896	16 48
4130	8 41	4481	11 52	4712	14 48	4899	16 50
4136	8 41	4484	11 53	4715	14 49	4901	16 52
4140	See Rumker 9	4486	11 54	4716	14 50	4904	16 56
4142	See *h* 4130	4490	11 57	4718	14 51	4906	See Hargrave [288]
4143	$8^h\ 46^m$	4495	12 0	4722	14 53	4908	λ...($16^h\ 54^m$)
4144	8 46	4498	12 1	4723	14 54	4909	$16^h\ 56^m$
4145	See *h* 4148	4501	See η Crucis	4728	14 58	4913	16 57
4148	$8^h\ 47^m$	4505	$12^h\ 6^m$	4731	15 5	4914	17 1
4165	8 58	4506	12 6	4734	15 3	4919	See Dunlop 213
4167	8 58	4507	12 7	4735	15 4	4920	$17^h\ 4^m$
4178	9 2	4518	12 19	4740	15 4	4923	17 3
4188	9 8	4521	See α Crucis	4742	15 8	4926	17 7
4190	9 8	4527	See Rejected Stars	4750	15 9	4931	17 11

Note.—*h* 4668 to *h* 4670 on page 227 of his "Astronomical Results," should be *h* 4968 to *h* 4970.

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THE HERSCHELS' STARS—*continued.*

h		*h*		*h*		*h*	
4935	$17^h\ 12^m$	5031	$18^h\ 7^m$	5152	$19^h\ 47^m$	5278	$21^h\ 35^m$
4942	17 16	5032	18 6	5163	19 56	5292	21 47
4945	17 17	5034	18 8	5167	20 2	5296	21 41
4949	17 19	5035	See *h* 2822	5173	20 4	5316	22 0
4953	See Dunlop 217	5041	$18^h\ 17^m$	5177	20 6	5319	22 6
4957	$17^h\ 24^m$	5045	18 23	5178	20 7	5324	Howe ($21^h\ 56^m$)
4962	17 28	5053	See Russell 309	5188	20 14	5334	$22^h\ 20^m$
4963	17 29	5057	$18^h\ 37^m$	5189	20 15	5344	22 29
4970	17 34	5066	18 43	5190	20 15	5348	22 32
4975	17 40	5067	18 45	5194	20 20	5356	See ♅. N. 17
4978	17 42	5069	18 47	5204	20 25	5362	$22^h\ 40^m$
4979	17 43	5073	See β 1033	5209	20 30	5365	22 46
4981	17 43	5075	$18^h\ 54^m$	5218	20 39	5367	22 46
4992	17 48	5078	18 55	5220	See β 153	5379	See *h* 5381
4996	17 51	5080	18 56	5222	See Rumker 26	5381	$23^h\ 0^m$
5000	17 52	5082	18 57	5224	$20^h\ 43^m$	5382	22 59
5003	17 52	5084	18 59	5231	20 48	5387	23 7
5009	17 58	5085	19 1	5233	20 57	5392	23 12
5010	17 58	5101	See Cordoba [55]	5235	21 0	5394	23 14
5013	See *h* 5014	5103	$19^h\ 15^m$	5245	See *h* 5235	5395	23 15
5014	$17^h\ 59^m$	5107	See Dunlop 226	5246	$21^h\ 3^m$	5411	See Dunlop 251
5015	18 1	5113	$19^h\ 18^m$	5252	See ♅. I. 47	5414	$23^h\ 37^m$
5021	18 3	5114	19 19	5258	$21^h\ 12^m$	5417	23 39
5023	18 3	5117	19 21	5261	21 28	5437	23 55
5027	18 5	5120	19 23	5267	21 20	5440	23 57
5028	18 5	5140	19 40	5271	21 21	5517	See β 272
5029	18 6	5141	19 40				

THE STRUVES' STARS.

Σ		Σ		Σ		Σ	
15	$0^h\ 10^m$	547	$4^h\ 20^m$	836	$5^h\ 57^m$	1146	$7^h\ 43^m$
23	0 12	564	4 28	850	6 2	1152	See Σ 1154
39	Secchi ($0^h\ 29^m$)	590	See ♅. III. 99	919	See ♅. II. 17	1154	$7^h\ 47^m$
49	$0^h\ 35^m$	614	$4^h\ 49^m$	955	$6^h\ 36^m$	1157	7 49
91	1 2	631	4 56	971	6 43	1216	8 16
113	1 14	636	4 58	987	6 49	1260	See Lalande 66
120	1 19	655	See ♅. III. 67	990	See Σ 997	1270	See Lalande 67
147	See Lalande 8	661	$5^h\ 8^m$	997	$6^h\ 51^m$	1295	See ♅. II. 77
171	$1^h\ 43^m$	667	See ♅. I. 54	998	6 51	1357	$9^h\ 23^m$
218	See Lalande 12	668	See ♅. II. 33	1011	6 56	1416	10 7
231	See ♅. IV. 25	692	See β 190	1019	Dembowski 12	1441	10 25
280	$2^h\ 29^m$	701	See ♅. II. 102	1026	See β 328	1445	10 27
295	2 36	725	$5^h\ 24^m$	1029	$7^h\ 3^m$	1470	10 41
315	2 44	734	$5^h 28^m$ and β 1049	1031	7 4	1474	See β 595
356	See β 527	743	$5^h\ 29^m$	1034	7 4	1476	$10^h\ 44^m$
357	$3^h\ 3^m$	748	See θ Orionis	1043	7 7	1500	10 54
358	See β 528	750	See ♅. II. 26	1049	7 8	1560	11 33
407	$3^h\ 25^m$	752	See ♅. III. 12	1056	7 10	1593	11 58
408	3 25	754	$5^h\ 31^m$	1057	See β 575	1604	12 4
470	See ♅. II. 36	757	5 32	1085	$7^h\ 19^m$	1619	See Lalande 96
489	$3^h\ 57^m$	758	See Σ 757	1097	See β 332	1669	Lalande ($12^h\ 36^m$)
516	See ♅. N. 24	774	See ζ Orionis	1104	$7^h\ 24^m$		
518	See ♅. II. 80	790	$5^h\ 41^m$	1121	See ♅. II. 63	1670	See γ Virginis
536	$4^h\ 17^m$	809	See β 1188	1133	$7^h\ 37^m$	1690	See ♅. II. 42
544	4 20	826	$5^h\ 53^m$	1138	See ♅. IV. 91	1724	See ♅. III. 50

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THE STRUVES' STARS—*continued.*

Σ		Σ		Σ		Σ	
1738	$13^h\ 17^m$	2171	$17^h\ 23^m$	2597	$19^h\ 49^m$	3030	$23^h\ 35^m$
1763	See H. I. 80	2173	17 25	2643	20 7	3036	23 40
1780 rej.	See β 935	2234	See Σ 3128	2729	20 46	3046	23 51
1788	$13^h\ 49^m$	2262	$17^h\ 57^m$	2745	20 58	3063	0 2
1799	13 59	2296	18 10	2752	21 1	3081	13 31
1802	14 2	2303	18 14	2781	21 11	3090	15 3
1833	14 17	2306	18 16	2826	21 42	3091	15 10
1837	14 19	2313	18 19	2847	21 52	3094	15 33
1846	14 23	2347	18 32	2909	22 23	3095	15 39
1876	14 41	2373	18 40	2928	22 34	3099	15 49
1925	15 11	2379	18 41	2935	See H. I. 50	3101	15 53
1974	15 43	2434	18 57	2944	See H. II. 57	3105	16 26
1985	See H. II. 85	2490	19 12	2970	See β 481	3106	16 50
1998	$15^h\ 58^m$	2503	19 17	2980	$23^h\ 4^m$	3116	6 16
2005 rej.	See β 948	2535	Dembowski 21	2981	See Σ 2980	3126	See Σ 1974
2048	$16^h\ 23^m$	2541	$19^h\ 31^m$	2988	See Lalande 185	3128	$17^h\ 47^m$
2119	17 0	2545	See H. I. 13	2995	See β 79		
2132	17 7	2547	,,	2998	See H. III. 34	OΣ	
2156	17 18	2582	$19^h\ 44^m$	3008	See H. N. 112	256	$12^h\ 51^m$

BURNHAM'S STARS.

β		β		β		β	
6	$1^h\ 39^m$	81	$23^h\ 30^m$	142	See Schjellerup$_2$ 30	215	$9^h\ 49^m$
7	1 52	83	2 41	146	$19^h\ 41^m$	216	9 52
10	2 45	84	3 11	148	19 46	217	10 2
11	2 57	89	5 32	153	20 41	218	10 2
12	3 19	94	See Jacob	154	20 47	219	10 16
13	5 29	97	$6^h\ 19^m$	157	21 1	220	11 7
15	5 42	98	6 27	168	21 48	221	13 7
16	5 57	101	4 47	169	21 51	222	13 12
17	6 3	102	8 11	170	22 3	225	14 19
18	6 12	103	8 50	172	22 18	226	14 33
19	6 37	106	14 43	177	22 47	227	15 13
20	6 44	110	See *h* 2036	178	22 50	228	See *h* 4756
24	8 49	111	$10^h\ 46^m$	181	23 8	233	$0^h\ 50^m$
25	See Schjellerup$_2$ 16	114	13 29	182	23 11	234	0 55
26	$11^h\ 18^m$	116	Cape ($14^h\ 14^m$)	183	1 48	239	14 52
28	12 24	117	$14^h\ 25^m$	184	4 23	241	16 49
33	15 25	118	14 48	185	4 32	242	17 18
34	See β 33	119	15 0	186	4 41	243	18 2
35	$15^h\ 37^m$	120	16 6	189	5 15	244	18 2
36	15 47	121	15 33	190	5 15	245	18 3
37	15 56	122	15 34	195	6 38	246	18 11
38	15 56	123	16 48	197	7 7	251	21 6
39	16 2	124	17 5	199	7 25	252	21 14
40	16 5	125	$17^h\ 5^m$ and β 956	201	See Argelander [2]	256	0 14
47	17 55	126	$17^h\ 14^m$	202	$7^h\ 57^m$	259	1 47
48	18 15	127	See Harvard 144	205	8 28	261	2 39
56	19 59	128	$17^h\ 20^m$	206	8 31	267	20 36
60	See Mitchel	129	17 22	207	8 34	271	21 13
61	See H. II. 51	131	18 7	208	8 34	272	21 18
72	$21^h\ 24^m$	132	18 5	210	8 52	276	21 55
76	22 24	133	18 21	212	9 11	279	23 37
77	22 28	135	18 32	213	9 23	282	17 9
79	23 12	138	19 7	214	9 36	283	17 55

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BURNHAM'S STARS—*continued.*

β	
285*a*	18h 10m
285*b*	18 10
286	18 9
300	See β 639
301	0h 44m
308	3 33
311	4 22
312	4 43
314	4 54
316	4 47
318	5 11
319	5 22
320	5 23
321*a*	5 34
321*b*	5 34
322	5 35
323	6 9
324	6 45
325	6 47
327	6 53
328	7h 1m and β 754
330	7h 14m
331	7 15
332	7 23
333	7 58
334	8 2
336	9 7
339	9 26
341	12 58
342	13 9
343	13 46
344	13 53
345	14 35
346	14 42
347	14 48
350	15 9
354	15 37
368	21 2
384	22 57
391	0 4
393	0 13
395	0 32
399	1 22
401	3h 45m and β 539
403	4h 20m
407	8 46
409	8 55
410	9 5
411	10 31
412	12 3
414	14 35
416	See Melbourne [4]
419	18h 26m
423	19 21
454	8 11
456	11 31
457	11 56
460	13 19
462	14h 24m
463	18 11
467	19 40
473	21 2
475	22 7
478	22 24
481	22 57
486	0 9
488	0 18
490	0 30
494	0 41
501	1 1
511	1 43
514	1 54
516	2 0
519	2 24
520	2 31
527	3 1
528	3 3
529	3 9
531	3 18
532	3 28
534	3 33
539	3 44
541	3 49
542	3 51
543	3 52
548	4 11
555	5 9
556	5 19
564	5 56
565	6 4
566	6 9
567	6 10
568	6 19
569	6 20
570	6 23
572	6 56
573	6 57
574	7 2
575	7 10
578	7 22
583	8 4
586	8 42
587	8 46
590	9 22
591	9 24
592	9 50
595	10 43
600	11 11
601	11 24
605	12 15
606	12 21
607	12 36
609	13 5
610	13 8
611	13 32
617	14 43
618	15h 6m
620	15 40
623	15 55
624	16 16
631	17 34
639	18 12
654	19 30
662	20 15
668	20 26
674	20 39
678	20 55
683	21 21
684	21h 24m and β 72
693	21h 50m
709	22 36
714	23 8
715	23 9
716	23 10
721	23 31
723	23 35
725	23 37
726	23 41
730	23 53
731	23 54
734	0 47
735	O. Stone (0h 59m)
737	O. Stone (2h 13m)
738	2h 18m
739	2 20
741	2 52
744	4 17
746	4h 27m and Innes 154
747	4h 29m
748	4 48
750	See Jacob [2]
751	See Jacob [12]
753	6h 24m
754	6 31
755	6 31
757	7 8
759	18 5
760	18 10
761	19 33
762	O. Stone (20h 10m)
763	20h 17m
764	20 53
765	20 54
766	21 18
767	See Melbourne [6]
768	See Rejected Stars
769	22h 5m
770	22 28
771	22h 31m and Innes 138
772	Howe (22h 50m)
775	Howe (23 31)
790	10h 5m
798	12h 59m
803	14 5
804	14 32
805*a*	See β 805 *b*
805*b*	14h 34m
806*a*	14 34
806*b*	14 34
807	14 37
808	14 52
809	15 4
819	16 31
820	16 34
824	17 43
827	19 39
830	19 50
832	20 1
833	20 6
840	21 47
871	1 42
877	2 45
881	4 29
882	4 33
884	4 58
885	5 5
897	6 45
898*a*	6 45
898*b*	6 45
902	7 53
903	7 59
904	8 8
905	8 11
906	8 12
907	8 15
908	9 9
910	9 28
911	10h 3m and β 218
912	10h 17m
914	10 40
916	11 9
920	12 10
921	12 12
922	12 21
926	12 53
927	See β 928
928	12h 58m
929	12 58
932	13 29
935*a*	13 40
935*b*	13 40
938	14 0
939	14 8
940	14 22
942	14 48
947	15 59
948	16 0
949	16 2
950	16 19
956	17h 5m and β 125

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BURNHAM'S STARS—*continued.*

β		β		β		β	
957	17h 10m	1032	5h 33m	1108	See Howe 25	1188	5h 45m
958	17 10	1033	18 49	1110	14h 13m	1195	7 46
960	17 33	1034	20 51	1112	14 27	1197	13 57
965	18 21	1035	21 18	1114	15 22	1205	20 6
966	18 26	1036	21 42	1115	16 19	1209	20. 35
967	18 35	1042	3 53		and H. II. 19	1211	20 58
969	See β 970	1048	See Harvard 73	1116	16h 38m	1212	21 34
970	18h 45m	1049	5h 28m	1117	16 50	1215	22 7
972	18 51	1050	5 31	1118	17 4	1219	22 44
974	18 59	1051	5 33	1119	17 10	1220	23 10
1000	1 30	1052	5 36	1120	See β 129	1229	1 14
1001	1 44	1063	7 45	1122	Howe (17h 45m)	1230	1 25
1002	2 42	1064	8 6	1123	17h 46m	1236	4 35
1003	3 41	1069	8 44	1126	17 58	1242	6 4
1004	3 58	1073	10 27	1128	18 24	1245	12 15
1006	5 7	1075	10 31	1158	0 26	1246	14 13
1010	22 50	1078	11 34	1160	0 44	1247	17 8
1011	22 57	1079	11 55	1163	1 19	1252	18 17
1012	Howe (23h 31m)	1084	13 17	1168	1 44	1254	18 39
1013	23h 43m	1085	14 53	1174	2 58	1262	See H. N. 139
1017	6 7	1089	17 24	1177	3 13	1264	22h 25m
1019	6 12	1107	13 21	1180	3 23		

CAPE OBSERVATORY.*

Cape		Cape		Cape		Cape	
1	1h 5m	7	6h 54m	12	12h 22m	17	17h 37m
2	1 52	8	See β 454	13	12 54	18	17 48
3	3 4	9	8h 49m	14	13 32	19	6 48
4	4 46	10	10 27	15	14 56	20	7 44
5	5 53	11	11 35	16	15 21	21	11 19
6	6 32					—	14 14

CORDOBA OBSERVATORY.*

Cordoba		Cordoba		Cordoba		Cordoba	
[1]	0h 19m	[20]	8h 53m	[38]	15h 3m	[56]	19h 34m
[2]	0 40	[21]	9 6	[39]	15 6	[57]	20 13
[3]	1 7	[22]	9 46	[40]	15 10	[58]	21 34
[4]	1 53	[23]	10 19	[41]	15 14	[59]	21 43
[5]	2 12	[24]	10 31	[42]	15 54	[60]	21 44
[6]	2 47	[25]	10 38	[43]	15 55	[61]	21 53
[7]	2 52	[26]	12 21	[44]	16 5	[62]	22 6
[8]	3 28	[27]	12 39	[45]	16 17	[63]	22 36
[9]	4 39	[28]	12 52	[46]	16 33	[64]	22 58
[10]	4 46	[29]	12 59	[47]	16 42	[65]	23 14
[11]	4 46	[30]	13 19	[48]	16 55	[66]	23 27
[12]	5 0	[31]	13 40	[49]	16 55	[67]	23 39
[13]	5 14	[32]	13 58	[50]	17 49	[68]	23 42
[14]	6 8	[33]	14 7	[51]	18 16	[69]	23 58
[15]	6 38	[34]	14 14	[52]	18 54	[70]	7 31
[16]	6 48	[35]	14 20	[53]	18 55	[71]	7 31
[17]	7 47	[36]	14 30	[54]	18 59	[72]	13 5
[18]	8 36	[37]	14 37	[55]	19 8	[73]	17 0
[19]	8 36					—	14 36

* See also List of Rejected Stars.

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HARVARD OBSERVATORIES.

Harvard		Harvard		Harvard		Harvard	
59	$2^h\ 49^m$	—	$5^h\ 36^m$	—	$15^h\ 29^m$	—	See Sellors 1
73	5 27	—	7 54	—	15 31	—	See Innes 27
88	O. Stone ($6^h\ 42^m$)	—	8 35	—	15 32	—	See Innes 55
104	See β 199	—	8 47	—	15 40	—	See Gale
109	See Harvard 110	—	8 49	—	15 49	—	See β 312
110	$7^h\ 46^m$	—	11 46	—	15 58	—	See β 755
114	See Rej. Stars	—	12 1	—	16 0	—	See Innes 7
118	"	—	12 13	—	16 3	—	See Howe 8
123	$9^h\ 19^m$	—	12 16	—	16 5	—	See Gilliss 91
125	10 1	—	12 23	—	16 8	—	See Innes 10
126	See β 217	—	12 41	—	16 8	—	See Innes 78
128	$10^h\ 35^m$	—	12 47	—	16 36	—	See Jacob [8]
129	See Jacob [7]	—	12 50	—	16 36	—	See Howe 19
131	See β 605	—	13 4	—	16 37	—	See h 4632
132	See β 1245	—	13 6	—	16 51	—	See Dunlop 156
134	See β 607	—	13 16	—	16 55	—	See Innes 87
135	O. Stone ($12^h\ 48^m$)	—	13 30	—	16 55	—	See Rumker 20
136	See β 222	—	13 40	—	16 58	—	See h 4813
137	See β 610	—	13 43	—	16 59	—	See Innes 91
138	See β 225	—	13 53	—	17 9	—	See Rej. Stars
139	See β 117	—	14 7	—	17 14	—	($16^h\ 15^m$)
140	See β 122	—	14 8	—	17 15	—	See Brisbane
141	See Rej. Stars	—	14 9	—	17 18	—	($17^h\ 11^m$)
144	$17^h\ 14^m$	—	14 20	—	17 20	—	See h 4942
146	See β 128	—	14 22	—	17 20	—	See h 5003
149	See β 245	—	14 23	—	17 27	—	Howe ($18^h\ 24^m$)
150	$18^h\ 56^m$	—	14 26	—	17 36	—	See β 771
151	See H. N. 129	—	14 29	—	17 42	—	See Dunlop 126
152	$19^h\ 8^m$	—	14 29	—	17 43	—	See Howe 25
153	See H. N. 119	—	14 35	—	17 44		See β 1112
168	See β 168	—	14 37		17 57	—	See Innes 236
173	See β 177	—	14 37	—	17 58		See λ 249
176	$23^h\ 20^m$	—	14 40	—	17 59	—	See Dunlop 193
—	0 1	—	14 40	—	18 1	—	See λ 25 8
—	0 26	—	14 49	—	18 3	—	See Innes 161
—	0 28	—	14 49	—	18 21	—	Washburn 131
—	0 41	—	14 58	—	18 36	—	See β 760
—	2 16	—	15 0	—	18 56	—	See Russell 314
—	3 50	—	15 8	—	20 58	—	See β 763
—	3 51	—	15 10	—	22 11	—	See β 766
—	4 37	—	15 16	—	See Cordoba [2]	—	Melbourne [6]
—	5 29	—	15 20	—	See Innes 47	—	Melbourne [8]

LOWELL OBSERVATORY.

λ		λ		λ		λ	
1	$0^h\ 0^m$	18	See h 3494	36	$4^h\ 16^m$	62	$6^h\ 7^m$
2	0 2	19	$2^h\ 36^m$	39	See β 312	66	6 21
3	0 4	21	2 47	40	$4^h\ 46^m$	70	6 37
5	0 20	22	3 8	42	4 49	73	6 55
6	0 21	23	3 13	44	4 57	76	7 16
10	0 57	24	3 21	45	5 1	77	7 18
11	1 13	26	3 28	47	5 5	78	7 18
12	1 14	27	3 28	48	5 8	79	7 22
13	1 16	30	3 42	53	5 23	80	7 26
15	1 36	32	3 44	55	5 42	84	7 35
16	2 1	35	4 15	58	5 58	87	7 45

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LOWELL OBSERVATORY—*continued.*

λ		λ		λ		λ	
88	$7^h\ 46^m$	186	$13^h\ 32^m$	318	$16^h\ 59^m$	416	$20^h\ 16^m$
89	7 49	187	13 36	320	17 5	417	20 17
91	7 52	192	See Innes 224	321	17 7	420	20 26
92	7 54	193	$13^h\ 51^m$	322	17 9	422	20 23
93	7 55	194	See Innes 234	323	17 9	423	20 34
94	See Innes 30	196	See θ Centauri	324	17 11	427	20 38
95	$8^h\ 2^m$	197	$14^h\ 2^m$	325	17 15	428	20 38
96	8 9	202	14 10	326	17 16	429	20 45
97	8 10	204	14 14	329	17 22	431	20 47
98	8 11	206	14 26	330	17 23	432	20 48
102	8 35	207	14 29	331	17 24	435	20 57
108	8 56	209	14 33	335	17 30	436	20 57
109	9 4	210	14 35	338	See Innes 108	441	21 9
110	9 8	212	14 41	342	$17^h\ 46^m$	443	21 12
111	9 11	213	14 42	343	See Russell 306	445	21 19
113	9 25	215	14 50	344	$17^h\ 52^m$	446	21 20
115	9 33	218	14 57	347	18 5	447	See Innes 133
116	9 41	219	15 2	348	18 8	448	$21^h\ 24^m$
119	10 33	221	15 9	350	18 14	449	21 25
125	10 47	228	15 15	351	18 17	454	21 36
126	10 55	229	15 15	352	18 19	455	21 38
128	11 10	236	15 22	353	18 24	456	21 39
129	11 17	238	15 27	356	See λ 357	458	21 40
130	11 18	241	15 30	357	$18^h\ 38^m$	459	21 42
133	See *h* 4465	242	See Innes 243	358	18 38	460	21 45
135	$11^h\ 42^m$	243	See Innes 244	359	18 39	461	21 50
137	11 47	244	See Addenda	361	18 43	465	21 58
138	11 47	245	$15^h\ 36^m$	364	18 49	466	21 58
139	11 49	248	15 38	366	See Pollock [7]	469	22 3
140	11 51	249	15 40	367	$18^h\ 57^m$	470	22 4
141	See *h* 4484	250	15 44	370	19 2	474	22 23
142	See Innes 215	251	15 51	372	19 12	475	22 27
143	$11^h\ 58^m$	254	15 54	373	19 19	476	22 39
145	12 5	258	15 55	376	19 21	477	See *h* 5362
146	12 5	259	15 55	377	Ormond Stone	478	$22^h\ 52^m$
147	12 8	262	15 58		$(19^h\ 18^m)$	480	23 9
149	12 15	264	15 59	380	19 25	481	23 11
151	12 20	266	16 3	381	19 26	483	23 20
152	12 20	267	16 5	382	19 28	484	23 20
154	12 21	268	16 8	384	19 29	485	23 21
156	12 30	269	16 9	385	19 31	486	See λ 484
157	12 31	271	16 12	387	19 32	492	$23^h\ 30^m$
158	12 33	272	16 12	388	19 32	493	23 32
159	12 36	273	16 13	389	19 33	494	23 36
160	12 40	277	See Innes 94	393	19 38	495	23 45
164	12 46	278	$16^h\ 19^m$	394	19 40	499	23 55
168	12 58	282	16 32	395	19 42	500	23 59
170	Harvard $(13^h\ 6^m)$	284	See Russell [283]	399	19 50	—	0 21
171	$13^h\ 9^m$	289	$16^h\ 44^m$	400	19 54	—	7 21
173	See Innes 233	291	16 46	403	19 57	—	12 3
174	$13^h\ 11^m$	292	16 46	404	19 59	—	16 13
177	See Innes 220	293	16 47	405	20 0	—	16 54
179	$13^h\ 25^m$	294	16 47	406	20 1	—	16 55
180	13 25	311	16 49	407	20 2	—	18 13
181	13 27	313	16 50	410	20 7	—	20 17
182	13 28	315	16 52	411	20 8	—	20 26
183	13 31	316	16 52	414	20 14	—	21 37
184	13 32						

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SYDNEY OBSERVATORY.

Russell		Russell		Russell		Hargrave	
3	$0^h\ 23^m$	193	$12^h\ 12^m$	307	$18^h\ 9^m$	[288]	$16^h\ 54^m$
4	0 30	198	12 17	308	See Melb'rne [5]	[317]	18 55
11	1 38	200	12 22	309	$18^h\ 34^m$	—	5 29
12	See *h* 3475	201	See Cape 12	310	See Russell 309	—	7 55
38	$4^h\ 0^m$	207	$12^h\ 40^m$	314	$18^h\ 37^m$		
47	See Russell 38	208	12 41	319	19 36		
51	See Russell 38	209	12 42	321	20 20	Pollock	
56	See Jacob [2]	210	See *h* 4563	322	See Dunlop 232	[1]	$1^h\ 34^m$
65	See Dunlop 30	213	$13^h\ 1^m$	323	$20^h\ 32^m$	[2]	4 1
82	See Gilliss 91	216	See *h* 4576	333	See *h* 5261	[3]	14 4
83	See *h* 4084	217	$13^h\ 21^m$	334	$21^h\ 30^m$	[4]	17 33
87	$8^h\ 53^m$	218	13 22	343	See *h* 5392	[5]	17 34
121	See Russell 122	220	13 23	344	See Dunlop 249	[6]	18 18
122	$9^h\ 29^m$	222	See *h* 4596	348	$23^h\ 33^m$	[7]	18 55
123	9 30	227	$13^h\ 49^m$	349	See Hargrave 19		
125	9 32	231	13 54				
127	See Rej. Stars	232	13 54			Sellors	
129	$9^h\ 39^m$	234	See Russell 232	Hargrave		1	$1^h\ 1^m$
139	10 12	243	See *h* 4671	2	$5^h\ 3^m$	2	1 4
140	10 15	244	$14^h\ 16^m$	9	7 7	3	1 39
141	10 17	248	14 29	19	8 46	4	3 10
142	See Cordoba [23]	249	14 29	20	8 49	5	3 38
149	$10^h\ 25^m$	255	See Gilliss 213	28	9 42	6	4 23
150	See Cape 10	262	See *h* 4780	47	10 0	7	6 27
151	$10^h\ 28^m$	265	See *h* 4780	53	10 48	8	8 29
152	10 35	267	See Rumker 20	54	10 52	9	8 45
153	See Dunlop 94	269	$15^h\ 51^m$	65	11 23	10	12 9
154	$10^h\ 39^m$	274	16 6	69	See Gilliss 165	11	15 46
155	10 42	275	$16^h\ 9^m$ and Innes 15	70	See Russell 177	12	16 32
161	10 45			71	See Gilliss 169	13	See Addenda
163	11 13	278	See Dunlop 201	74	$12^h\ 4^m$	14	$23^h\ 45^m$
164	10 55	281	$16^h\ 26^m$	77	12 42	15	5 52
165	11 8	282	See *h* 4874	78	See Hargrave 77	16	9 1
168	11 17	283	$16^h\ 35^m$	79	,,	17	10 10
171	11 20	287	See *h* 4901	81	See Cordoba [24]	18	13 16
173	11 32	289	See *h* 4909	83	See Melb'rne [3]	19	14 1
174	See *h* 4462	296	$17^h\ 7^m$	86	$13^h\ 25^m$	20	15 15
177	$11^h\ 40^m$	297	Bris. ($17^h\ 11^m$)	102	See Russell 249	21	16 33
180	11 41	298	See Melb'rne [4]	113	$15^h\ 9^m$	22	7 11
181	See *h* 4475	303	$17^h\ 36^m$	121	See Howe 37	23	7 17
191	$12^h\ 5^m$	304	See Cape 18	124	$17^h\ 34^m$	24	11 53
192	$12^h\ 6^m$ and Innes 216	306	$17^h\ 51^m$	128	18 5	—	22 58

WASHBURN OBSERVATORY.

Washburn		Washburn		Washburn		Washburn	
12	$12^h\ 16^m$	22	$14^h\ 56^m$	36	$19^h\ 49^m$	71	$3^h\ 53^m$
13	12 21	25	15 34	38	20 23	72	4 0
16	14 3	28	17 18	42	20 47	73	5 18
17	See β 803	29	17 25	53	22 43	76	5 29
18	$14^h\ 13^m$	30	17 31	62	0 57	77	5 40
19	14 37	31	17 33	66	3 47	78	5 44
20	14 40	33	18 56	67	3 49	82	6 46
21	14 50	35	19 18	70	3 53	91	7 36

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WASHBURN OBSERVATORY—*continued.*

Washburn		Washburn		Washburn		Washburn	
93	$7^h\ 54^m$	110	$10^h\ 40^m$	133	$17^h\ 17^m$	151	See Washbn. 35
94	7 55	112	See Gilliss 165	134	17 18	154	$20^h\ 0^m$
99	9 43	114	$11^h\ 49^m$	136	17 24	155	20 0
100	10 10	115	11 58	139	17 49	159	20 24
101	10 12	116	12 32	140	17 55	160	See Hough 133
102	10 15	118	13 1	141	18 8	162	$20^h\ 38^m$
103	10 15	119	Melbourne [3]	142	18 9	165	20 54
105	10 18	121	$15^h\ 5^m$	144	See Jacob [10]	167	21 37
106	10 29	124	15 37	145	$18^h\ 37^m$	169	22 25
107	10 30	127	15 59	147	18 43	170	23 7
108	10 34	131	16 52	149	19 16	174·	13 2
109	10 38	132	17 12				

THE OLD SANTIAGO OBSERVATORY.

Gilliss		Gilliss		Gilliss		Gilliss	
4	$0^h\ 48^m$	91	$8^h\ 13^m$	169	$11^h\ 46^m$	259	$20^h\ 25^m$
9	1 7		See Dunlop 94	213	14 52	263	20 51
14	1 39	165	$11^h\ 31^m$	248	18 48	289	23 55

LALANDE.

Lalande		Lalande		Lalande		Lalande	
4	$0^h\ 53^m$	67	$8^h\ 40^m$	145	$18^h\ 40^m$	192	$23^h\ 49^m$
8	1 36	94	12 6	170	21 11	—	7 12
12	2 3	96	12 10	180	22 34	—	12 36
53	7 15	123	15 27	185	23 6	—	See Σ 3094
66	8 35	141	18 19				

RUMKER.

Rumker		Rumker		Rumker		Rumker	
2	$1^h\ 4^m$	7	See Dunlop 66	14	$12^h\ 8^m$	21	$15^h\ 53^m$
3	4 16	9	$8^h\ 42^m$	18	13 45	26	20 43
4	4 22	12	9 53	19	See Dunlop 159	27	See Dunlop 251
6	7 17	13	10 17	20	$15^h\ 38^m$		

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DUNLOP.

Dunlop		Dunlop		Dunlop		Dunlop	
1	See β Toucani	52	See H. N. 19	133	See J Centauri	201	$16^h\ 18^m$
2	$0^h\ 48^m$	53	See k Puppis	138	See H. N. 69	213	17 2
5	1 35	57	$7^h\ 43^m$	141	$13^h\ 35^m$	214	17 3
8	See β 741	63	8 6	143	13 42	216	See h 4949
9	Piazzi ($2^h\ 54^m$)	65	See γ Argûs	148	See H. III. 101	217	$17^h\ 21^m$
12	$3^h\ 13^m$	66	$8^h\ 7^m$	151	$13^h\ 50^m$	222	18 26
15	3 36	70	8 26	156	14 0	226	19 15
16	3 44	78	9 26	159	14 15	227	19 44
18	4 48	81	9 50	166	14 34	230	20 11
22	5 28	88	See s Velorum	168	14 35	232	20 29
23	6 2	93	See Innes 74	177	15 4	240	Piazzi ($22^h\ 25^m$)
[26]	6 11	94	$10^h\ 34^m$	180	See h 4753	242	See H. N. 117
30	See Sellors 7	109	11 23	182	See Copeland [2]	246	$23^h\ 1^m$
31	$6^h\ 35^m$	111	See H. III. 96	189	See Innes 88	248	23 15
32	6 38	126	$12^h\ 48^m$	190	$15^h\ 34^m$	249	23 18
39	7 1	128	13 1	193	15 43	251	23 34
42	7 9	129	13 1	195	15 47	253	See Lalande 192
51	7 26						

JACOB.

Jacob		Jacob		Jacob		Jacob	
[1]	$3^h\ 15^m$	[5]	$8^h\ 42^m$	[8]	$12^h\ 4^m$	[11]	$20^h\ 27^m$
[2]	5 0	[6]	9 26	[9]	16 6	[12]	23 1
[3]	5 45	[7]	11 24	[10]	18 19	—	See Innes 55
[4]	7 14						

ORMOND STONE.

Ormond Stone		Ormond Stone		Ormond Stone		Ormond Stone	
—	$0^h\ 47^m$	—	$7^h\ 21^m$	—	$14^h\ 19^m$	—	$20^h\ 10^m$
—	0 59	—	8 5	—	17 15	—	20 32
—	2 13	—	12 41	—	17 55	—	21 11
—	3 5	—	12 48	—	18 27	—	21 42
—	5 18	—	12 48	—	18 38	—	22 37
—	6 34	—	12 52	—	19 18	—	22 53
—	6 42	—	13 20	—	19 41	—	23 22
—	6 51						

See also the List of Rejected Stars on p. 242A.

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SOUTH.

South		South		South		South	
390	See Lalande 4	538	See β 324	651	See ♅. N. 69	802	$21^h\ 56^m$
423	See β 741	552	See ♅. N. 19	673	See Lalande 123	824	See Lalande 185
497	See Σ 790	580	See Lalande 67	710	$19^h\ 1^m$	829	See ♅. N. 112
504	$5^h\ 54^m$	634	See Lalande 94	715	See h 596	—	$18^h\ 14^m$
537	See β 324						

SOUTH AND HERSCHEL.

South and h		South and h		South and h		South and h	
145	See ♅. IV. 105	240	$16^h\ 51^m$	264	See β 639	346	Mayer ($22^h\ 23^m$)
190	See ♅. N. 28	243	17 9	339	See ♅. N. 56	354	See ♅. III. 34
224	See ♅. IV. 21	245	See ♅. III. 25	345	Bradley ($22^h\ 21^m$)	356	See ♅. II. 24
228	See ♅. II. 19						

HOUGH.

Hough		Hough		Hough		Hough	
35	$7^h\ 32^m$	313	$2^h\ 18^m$	371	$10^h\ 1^m$	436	$18^h\ 32^m$
37	7 44	314	2 19	373	See Washbn. 108	438	See β 1254
44	10 6	315	2 31	386	$14^h\ 22^m$	439	$18^h\ 43^m$
96	See Hough 441	329	See Hough 330	391	14 58	441	19 1
103	See Σ 2490	330	$4^h\ 18^m$	395	See Howe 38	461	20 54
106	$19^h\ 22^m$	338	6 13	401	See h 4836	462	20 59
133	20 27	339	See β 568	403	$16^h\ 19^m$	468	21 58
135	20 35	344	$7^h\ 10^m$	404	See Howe 42	469	21 57
142	20 43	352	8 4	408	$16^h\ 49^m$	521	7 18
149	21 2	355	8 37	413	17 10	—	7 18
158	21 19	356	8 47	422	17 47	—	18 17
199	23 13	358	8 53	428	18 3	—	18 30
215	See Muller	359	8 54	429	18 6	—	See Howe 46
277	Schjellerup$_2$ 33	363	9 10	435	18 26		

HOWE.

Howe		Howe		Howe		Howe	
1	$0^h\ 50^m$	18	See Jacob [8]	38	$15^h\ 33^m$	—	$8^h\ 12^m$
3	2 26	19	$12^h\ 8^m$	39	15 41	—	17 45
5	4 8	21	12 17	40	15 54	—	18 24
6	4 35	22	13 7	41	15 57	—	19 17
7	7 29	23	13 37	42	16 19	—	20 20
8	7 48	24	13 43	46	17 7	—	21 21
9	8 13	25	13 47	47	17 23	—	21 38
10	9 2	26	13 49	48	17 24	—	21 42
11	9 35	27	See Howe 28	50	17 58	—	21 56
12	See Howe 13	28	$14^h\ 12^m$	—	1 28	—	22 2
13	$10^h\ 10^m$	29	14 30	—	2 39	—	22 50
14	10 53	30	See h 4722	—	4 3	—	23 0
15	10 58	32	$15^h\ 15^m$	—	5 11	—	23 7
16	11 34	34	15 25	—	7 10	—	23 18
17	11 49	37	15 37	—	7 57	—	23 31

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INNES.

Innes		Innes		Innes		Innes	
1	U.A. 64 Toucani	62	$5^h\ 27^m$	120	$19^h\ 40^m$	178	$6^h\ 31^m$
2	See Pollock 2	63	5 45	121	19 42	179	6 41
3	$6^h\ 11^m$	64	5 49	122	19 43	180	6 42
4	6 27	65	6 53	123	20 3	181	6 46
5	6 36	66	6 54	124	20 9	182	6 47
6	6 41	67	8 19	125	20 9	183	6 56
7	7 14	68	8 32	126	20 15	184	7 7
8	7 59	69	See Cordoba [18]	127	20 27	185	7 36
9	8 15	70	$8^h\ 43^m$	128	20 36	186	7 45
10	8 41	71	8 53	129	20 48	187	7 57
11	9 11	72	9 23	130	20 57	188	7 58
12	See *h* 4206	73	10 24	131	21 14	189	8 1
13	$10^h\ 7^m$	74	10 31	132	21 16	190	8 2
14	See Russell 192	75	Cordoba ($10^h\ 34^m$)	133	21 23	191	8 5
15	$16^h\ 10^m$	76	$11^h\ 22^m$	134	22 16	192	8 8
16	5 49	77	See *h* 4445	135	22 16	193	8 9
17	20 37	78	$11^h\ 28^m$	136	22 19	195	8 30
18	20 47	79	11 49	137	22 20	196	9 2
19	21 40	80	11 50	138	22 32	197	9 4
20	22 10	81	12 9	139	Cruls ($22^h\ 39^m$)	198	9 16
21	See Cordoba [63]	82	12 25	140	$22^h\ 41^m$	199	9 23
22	$22^h\ 49^m$	83	12 50	141	22 43	200	9 29
23	23 22	84	14 48	142	Howe ($23^h\ 7^m$)	201	9 30
24	See Cordoba [66]	85	14 58	143	$23^h\ 9^m$	202	9 34
25	$23^h\ 29^m$	86	15 14	144	23 20	203	9 35
26	7 54	87	15 18	145	23 25	204	9 43
27	1 11	88	15 31	146	23 49	205	9 44
28	2 42	89	15 34	147	2 17	206	10 14
29	7 55	90	15 41	148	2 52	207	10 14
30	7 55	91	16 13	149	2 52	208	10 19
31	9 27	92	See *h* 4843	150	3 15	209	10 20
32	10 28	93	$16^h\ 19^m$	151	3 18	210	10 23
33	10 27	94	16 19	152	4 1	211	10 54
34	11 34	95	16 26	153	4 4	212	10 58
35	12 19	96	16 33	154	4 27	213	11 5
36	12 23	97	16 33	155	5 55	214	See Howe 17
39	16 35	98	See Russell 283	156	6 23	215	$11^h\ 56^m$
40	17 24	99	$16^h\ 42^m$	157	6 44	216	12 4
41	20 29	100	16 47	158	6 44	217	See Howe 19
43	0 5	101	16 47	159	6 47	218	$12^h\ 23^m$
44	0 23	102	See Cordoba [73]	160	7 36	219	12 26
45	0 28	103	See Rejected Stars	161	7 43	220	13 19
46	0 35	104	$17^h\ 9^m$	162	7 52	221	13 31
47	0 47	105	17 25	163	7 57	222	See Howe 23
48	0 54	106	17 29	164	8 2	223	$13^h\ 40^m$
49	0 56	107	17 33	165	8 6	224	13 50
50	1 12	108	17 40	166	8 11	225	13 54
51	1 30	109	17 49	167	8 11	226	14 48
52	1 43	110	17 51	168	8 27	227	14 50
53	2 35	111	18 7	169	9 7	228	15 7
54	3 5	112	18 46	170	9 17	229	17 8
55	3 8	113	18 51	171	See Jacob [6]	230	17 53
56	3 15	114	19 10	172	$9^h\ 43^m$	231	11 8
57	3 24	115	19 16	173	10 2	232	11 34
58	3 24	116	19 16	174	10 27	233	13 11
59	4 21	117	19 23	175	10 32	234	13 51
60	4 38	118	19 25	176	11 1	235	14 39
61	5 15	119	19 34	177	0 23	236	14 43

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INNES—*continued.*

Innes		Innes		Innes		Innes	
237	14h 52m	256	19h 54m	275	5h 19m	293	10h 0m
238	15 5	257	20 56	276	5 27	294	10 44
239	15 22	258	21 4	277	5 36	295	11 4
240	15 27	259	22 58	278	5 42	296	12 32
241	15 28	260	0 26	279	5 42	297	12 48
242	15 31	261	0 43	280	6 6	298	13 25
243	15 31	262	1 4	281	6 17	299	20 7
244	15 33	263	1 18	282	6 21	300	20 40
245	15 40	264	1 27	283	6 39	301	21 0
246	17 3	265	1 56	284	6 41	302	21 32
247	17 31	266	2 10	285	7 35	303	22 12
248	17 38	267	2 41	286	7 49	304	22 40
249	18 10	268	2 44	287	8 55	305	23 42
250	18 34	269	3 58	288	9 6	306	10 51
251	18 43	270	4 14	289	9 29	307	11 34
252	18 54	271	4 18	290	9 58	308	11 36
253	19 12	272	4 18	291	9 59	309	12 25
254	19 23	273	4 48	292	9 59	310	13 5
255	19 25	274	5 0				

MISCELLANEOUS.

Argelander [1]	6h 1m	Clark, Al. G. 12	20h 12m	Melbourne [4]	17h 12m
,, [2]	7 34	Copeland [1]	9 26	,, [5]	18 24
Barnard	17 8	,, [2]	15 15	,, [6]	21 20
,,	20 15	Cruls	22 39	,, [7]	22 26
Berlin	13 48	Dawes 3	5 31	,, [8]	16 33
Brisbane	11 20	,, 4	5 30	Mitchel	18 16
,,	16 3	,, 5	5 19	,,	20 21
,,	17 11	,, 6	5 23	Muller	0 40
,,	18 54	Dembowski	7 1	Peters	5 18
,,	21 41	,,	19 26	Piazzi	2 54
Burg	16 23	Gale	1 3	,,	10 27
Cincinnati	See H. N. 56	,,	4 14	,,	15 50
,,	9h 35m	,,	18 14	,,	16 51
,,	14 24	,,	19 7	,,	22 25
,,	15 42	Hall, Asaph	21 33	Schjellerup$_2$ 13	8 47
,,	17 9	Hastings	2 11	,, 16	10 16
,,	17 57	Knott [1]	6 3	,, 24	18 14
Clark, Alvan 2	3 13	Kunowsky	5 35	,, 30	19 22
,, 3	6 6	Leavenworth	2 43	,, 33	20 15
,, 4	6 44	,,	3 39	,, 35	21 22
,, 5	9 47	,,	12 28	Secchi 1	0 29
,, 10	See Jacob [10]	,,	20 48	,, 2	1 18
,, 11	18h 19m	,,	21 38	Washington 1	0 48
,, 12	19 53	,,	22 5	,,	17 47
,, 22	See β 76	Melbourne [1]	0 37	Wilson, H. C.	9 15
Clark, Al. G. 1	6h 40m	,, [2]	8 3	,,	10 1
,, 5	12 55	,, [3]	13 8	,,	13 33

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LIST OF WORKS AND PAPERS ON DOUBLE STARS.

(Chiefly limited to treatises of general interest, or such as contain observations of Southern Double Stars.)

Works not consulted in the formation of the preceding Catalogue are marked: *Not seen.*

[1685.] **Fontenay**, Jean de. Discovery of the Duplicity of α Crucis with a 12-foot Telescope at the Cape in June 1685. The star is described as resembling Castor as to the interval between the components. The distant companion, Lac. 5147, is also noticed.

Histoire de l'Acad. depuis 1686–1699, T. II., Paris, 1733, p. 19 (p. 31 in another edition); *Lettres édifiantes*, Recueil VII., 1707, p. 79. (There are other editions of both these publications.) See also Humboldt's *Cosmos*, vol. iii. div. A., a, chap. vii. note 44. *Not seen.*

[1689.] **Richaud**, Jean. Mém. de l'Acad. depuis 1686–1699, T. VII. 2. Paris, 1729, p. 206.

Discovery of α Centauri as a Double Star at Pondicherry, in December 1689. *Not seen.*

1714. **Feuillée**, Louis. Journal des Observations physiques. . . . 4to, T. I. Paris.

Observation of α Centauri at Lima, on July 4, 1709. *Not seen.*

1718. **Bradley and Pound.**

Discovery of γ Virginis as double in 1718.

See Rigaud's *Miscellaneous Works and Correspondence of the Rev. James Bradley.* 4to. Oxford, 1832, p. 342. *Not seen.*

1757. **La Caille**, N. L. de. Astronomiæ Fundamenta Novissimis Solis et Stellarum Observationibus stabilita. . . . 4to. Parisiis.

Contains, on pp. 103 and 197, meridian observations of the components of α Centauri, made at the Cape in 1751 and 1752.

1763. **La Caille**, N. L. de. Cœlum Australe Stelliferum. 4to. Paris.

Zones containing observations of 9766 stars with a $\frac{1}{2}$-inch telescope in 1751–2.

Contains a few wide pairs such as β Toucani.

The zones have been reduced by T. Henderson, formerly director here, and published by the British Association for the Advancement of Science in 1 vol. 8vo. London, 1847.

The original work, and also La Caille's *Astronomiæ Fundamenta*, are exceedingly scarce.

1779. **Mayer**, Christian. De Novis in Coelo Sidereo Phaenomenis. . . . 128 pp. 4to. Mannhemii.

The first catalogue of 72 Double Stars with R.A. and Dec. for 1777. Gives differences of right ascension and declination. *Not seen.*

For H. C. F. C. Schjellerup's summary arranged according to constellations, see *Copernicus*, vol. iii. pp. 57–65.

1781. **Bode**, J. E. Verzeichniss aller bisher entdeckten Doppeltsterne. 8vo. Berlin.

(*Berliner Jahrbuch*, 1784.)

A Catalogue of 81 Double Stars chiefly from Christian Mayer's observations. *Not seen.*

1781. **Pigott**, N. [Three] Double Stars discovered in 1779. 4to. London.

(*Philosophical Transactions*, vol. lxxi.)

The stars are γ Delphini and two wide *Durchmusterung* pairs. *Not seen.*

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1782. **Herschel**, William. Catalogue of Double Stars. 4to. London.
(*Philosophical Transactions*, vol. lxxii.)

269 double stars. Includes the discovery of ξ Scorpii. *Not seen.*

1785. **Herschel**, William. Catalogue of Double Stars. 4to. London.
(*Philosophical Transactions*, vol. lxxv.)

434 double stars. Including τ Ophiuchi and 4 Aquarii.

1801. **Lalande**, J. de. Histoire Céleste Française. 4to. Paris.

The wide pairs occurring in this work have been collected by Labaume. See under 1831.

1803. **Herschel**, William. Account of the Changes that have happened, during the last Twenty-five Years, in the relative Situation of Double-Stars; etc. 4to. London.

(*Philosophical Transactions*, 1803, pp. 339–382.

Continued in the vol. for 1804.)

1814. **Piazzi**, Giuseppe. Praecipuarum Stellarum inerrantium Positiones Mediae, etc. Fol. Panormi.

Piazzi's Palermo Catalogue of 7646 stars, from which a few wide pairs have been taken.

1820. **Struve**, F. G. W. Observationes angulorum positionis stellarum duplicium et multiplicium, opera tubi achromatici quinque pedum micrometrico apparatu instructi anno 1819 institutae. 4to. Dorpati.

(*Dorpat Observations*, vol. ii. pp. 163–8.)

Few distances. Only a few southern doubles. One new northern pair.

On pp. 175–198 of the same volume there is an "Additamentum" on Double Stars, including 66 Ceti, γ Virginis, Mira Ceti, etc.

1822. **South**, James. Catalogue of Double Stars. 4to. London.
(*Mems. R. A. S.*, vol. i. pp. 115–128.)

A compilation of known double stars, of small value now.

1822. **Herschel**, Sir William. On the places of 145 new Double Stars. 4to. London.
(*Mems. R. A. S.*, vol. i. pp. 166–181.)

Particulars from observing books of 145 pairs. Like all Herschel's catalogues, interesting, but superseded for working purposes by Sir John Herschel's list in *Mems. R. A. S.*, vol. xxxv.

Some of the stars in this list have never been identified or re-observed; the positions are indifferent, and no magnitudes or position angles are given, the stars being merely referred to as Class I. or II., etc. These pairs have been omitted in the Reference Catalogue.

1822. **Struve**, F. G. W. Observationes astronomica[e] (1820 et 1821) [made at Dorpat]. Vol. iii. 4to. Dorpati.

Catalogus stellarum duplicium a 20° *decl. Austr. ad* 90° *decl. Bor. pro anno*, 1820, pp. xv–xxiv.

Struve's first catalogue (compiled), giving merely discoverer's name, name of star, magnitude, and R.A. and Dec. The discoverers include Struve himself, Herschel, Piazzi, Lalande (*Histoire Céleste*), Mayer, Gauss, Bessel, etc.

Also printed separately under the title "Catalogus 795 stellarum duplicium," etc.

A continuation of his measures of 1819 are contained on pp. 132–136 (last page printed, 361), and another series will be found on pp. 137–144.

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Further observations will be found in vol. iv. of the same series, 1825. But all Struve's earlier work is collected in the Mensuræ Micrometricæ (1837), which see.

1822. **Struve**, Prof. A Comparison of Observations made on Double-Stars. 4to. London.
(*Mems. R. A. S.*, vol. ii. pp. 443–455.)

Notes on the chief Double Stars communicated in a letter to J. F. W. Herschel.

1823. **Amici**, J. B. 8vo. Gênes.
(Zach's *Correspondance Astronomique*, etc., vol. viii. pp. 67, 216.)

Measures only. A description of his double image micrometer.

1825. **South**, J., and **Herschel**, J. F. W. Observations of the apparent distances and positions of 380 double and triple stars, made in the years 1821, 1822, and 1823.
(*Philosophical Transactions*, 1824. Part III. pp. 1–412, with an Index.) 4to. London.

Made with two equatorial refractors of $3\frac{3}{4}$ and 5 ins. aperture. Mostly wide northern pairs.

1826. **Herschel**, J. F. W. Approximate Places of 321 new Double and Triple Stars [with Descriptions]. 4to. London.
(*Mems. R. A. S.*, vol. ii. pp. 475–485.)

Sir John Herschel's first list containing the stars *h* 1 to *h* 321, discovered with the 20-feet reflector.

1826. **South**, Sir James. Observations of the apparent distances and positions of 458 double and triple stars, . . . with a re-examination of 36 stars, etc., 1823–4–5. 4to. London.
(*Philosophical Transactions*, 1826. Part I. pp. 1–391, with a Synoptical View.) *Not seen.*

1827. **Struve**, F. G. W. Catalogus novus Stellarum Duplicium et Multiplicium maxima ex parte . . . in specula Dorpatense . . . detectarum. fol. Dorpati.

Places and descriptions of 3112 double and multiple stars, nearly all discovered with the 9·6-inch Fraunhofer refractor. Some measures are given in notes at the end.

The *Dorpat Catalogue*. *Not seen.*

1829. **Dunlop**, James. Approximate Places of Double Stars in the Southern Hemisphere, observed at Paramatta in New South Wales. In a Letter addressed to Sir T. Macdougal Brisbane. 4to. London.
(*Mems. R. A. S.*, vol. iii. pp. 257–275.)

This is Dunlop's well-known list of Double Stars in the Southern Hemisphere, made with a 9-feet Reflecting Telescope between 1825 and 1827. Containing Dunlop 1 to Dunlop 253.

The stars are not of much interest, as a rule being very wide, and in several cases the observations seem erroneous, or, at least, they have not been confirmed with more powerful instruments.

1829. **Herschel**, J. F. W. Approximate Places and Descriptions of 295 new Double and Triple Stars, discovered . . . with a 20-feet Reflecting Telescope: together with some Observations of Double Stars previously known. 4to. London.
(*Mems. R. A. S.*, vol. iii. pp. 47–63.)

Sir John Herschel's 2nd list containing stars *h* 322 to *h* 616, with a few measures of other double stars.

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1829. **Herschel**, J. F. W. Observations with a 20-feet Reflecting Telescope.—Third Series; containing a Catalogue of 384 new Double and Multiple Stars; completing a first Thousand of those Objects detected in a Course of Sweeps with that Instrument: together with some Observations of some previously known. 4to. London.

(*Mems. R. A. S.*, vol. iii. pp. 177–213.)

Preceded by an interesting introduction and a "Comparative Catalogue of 284 Double Stars, as observed with the Dorpat Refractor and the 20-feet Reflector."

Sir John Herschel's 3rd list containing the stars *h* 617 to *h* 1000.

1831. **Herschel**, J. F. W. Fourth Series of Observations with a 20-feet Reflector; containing the mean places and other particulars of 1236 Double Stars, as determined at Slough, in the years 1828 and 1829, with that Instrument, (the greater part of them not previously described). 4to. London.

(*Mems. R. A. S.*, vol. iv. pp. 331–378.)

Contains the double stars *h* 1001 to *h* 1937. Prefaced by a few interesting remarks as to the relative power of his reflectors compared with the refractor used by Σ.

1831. **Labaume**, Berenger. A catalogue of 195 double Stars, taken from the Histoire Céleste of M. F. Lalande, reduced to January 1, 1800. 4to. London.

(*Mems. R. A. S.*, vol. iv. pp. 165–170.)

Communicated by Baron Zach. Many of these stars are to be found as new pairs in the catalogues of later observers, albeit all are, as might be expected, very easy to see.

Referred to in the Catalogue as "Lalande" with Labaume's number.

The date of publication of these pairs is, of course, the date of the *Histoire Céleste*, 1801.

1832. **Rumker**, C. Preliminary Catalogue of Fixed Stars intended for a Prospectus of a Catalogue of the Stars in the Southern Hemisphere, etc. 4to. Hamburgh.

In this work there is a section on *Double Stars*, pp. 15–16, with a list of 28 pairs. One of these, α Argûs, is credited with a *comes* about 12″ S.f., the real existence of which is very doubtful. Rumker's remarks on α Crucis and α Centauri are curious reading; he inclines to the opinion that α Crucis is in motion, but α Centauri, he says, "cannot be classed among the double stars, the contiguous stars not being close enough. . . . There has therefore, in seventy-seven years, no important change taken place in the relative situation of these two stars."

1833. **Dawes**, Rev. W. R. Observations of Double Stars. 4to. London.

(*Mems. R. A. S.*, vol. v. pp. 139–146.)

Excepting γ Virginis, all northern stars.

1833. **Herschel**, J. F. W. Micrometrical Measures of 364 Double Stars with a 7-feet Equatorial Achromatic Telescope, taken at Slough, in the years 1828, 1829, and 1830. 4to. London.

(*Mems. R. A. S.*, vol. v. pp. 13–91.)

Preceded by an interesting preface on the effect of strain on an object glass, and a list of measures of the chief double stars by different observers, including the southern stars γ Virginis and ζ Aquarii.

General hints on observation are given on pp. 47–18.

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1833. **Herschel**, Sir J. F. W. On the Investigation of the Orbits of revolving Double Stars; being a Supplement to a Paper entitled "Micrometrical Measures of 364 Double Stars," etc., etc. 4to. London.

(*Mems. R. A. S.*, vol. v. pp. 171–222.)

Containing Sir John Herschel's well-known method of finding Double Star Orbits.

1833. **Herschel**, Sir J. F. W. Fifth Catalogue of Double Stars observed at Slough in the years 1830 and 1831 with the 20-feet Reflector; containing the Places, Descriptions, and measured Angles of Position of 2007 of those objects, of which 1304 have not been found described in any previous collection; the whole reduced to the epoch 1830·0. 4to. London.

(*Mems. R. A. S.*, vol. vi. pp. 1–73.)

Contains the double stars *h* 1938 to *h* 3241.

The above paper is followed by one entitled "Remarks on a Fifth Catalogue of Double Stars, etc."; on a comparison of *h*'s measures with those of Σ, and on the colours of stars as affected by refractors and reflectors. A list of Errata is also added.

1835. **Bessel**, F. W. Beobachtungen der gegenseitigen Stellungen von 38 Doppelsternen.

(*Berlin Acad., Abhand.*, 1833, p. 57.)

Reprinted in 1841.

1835. **Brisbane**, Sir Thomas Macdougall. A catalogue of 7385 Stars . . . from Observations made in the years 1822–1826, at the Observatory at Paramatta, founded by Sir T. M. Brisbane. Reduced by W. Richardson. 4to. London.

A few double stars have been taken from this catalogue.

1835. **Dawes**, W. R. Micrometrical Measurements of the Positions and Distances of 121 Double Stars, taken at Ormskirk, during the years 1830, 1831, 1832, and 1833. 4to. London.

(*Mems. R. A. S.*, vol. viii. pp. 61–94.)

Made with a 3·8-inch refractor. Dawes says in the preface that he has frequently used powers of 475 and 600.

The effects of a central stop on the object-glass are described.

1835. **Herschel**, Sir J. F. W. List of Test Objects, principally Double Stars, arranged in Classes, for the trial of telescopes in various respects, as to light, distinctness, etc. 4to. London.

(*Mems. R. A. S.*, vol. viii. pp. 25–32.)

1835. **Herschel**, Sir J. F. W. A Second Series of Micrometrical Measures of Double Stars, chiefly performed with the 7-feet Equatorial, at Slough, in the years 1831, 2, and 3. 4to. London.

(*Mems. R. A. S.*, vol. viii. pp. 37–59.)

Some measures by Smyth and by Dawes are appended.

1835–1837. **Mädler**, J. H. Doppelstern-Messungen.

Astr. Nachr., Band 12, No. 280.
" " " 13, Nos. 299, 303.
" " " 14, No. 324.

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1836. **Herschel**, Sir **J. F. W.** Sixth Catalogue of Double Stars, observed at Slough, in the years 1831 and 1832, with the 20-feet Reflector, containing the Places, etc. of 286 of those Objects, of which 105 have not been previously described. 4to. London.

(*Mems. R. A. S.*, vol. ix. pp. 193–204.)

Contains the stars *h* 3242 to *h* 3346 and measures of Σ's and other double stars. All the stars, except two, are north of the Equator.

1837. **Struve**, F. G. W. Stellarum Duplicium et Multiplicium Mensurae Micrometricae. fol. Petropoli.

The publication of this great work gave an enormous impulse to Double Star Astronomy.

It contains no stars south of —15° Declination. This work is too large for convenient use, but it has been most usefully indexed by the late Robert Copeland (1876).

Struve also published popular descriptions of this work in French and German in 1837.

1839. **Mädler**, J. H. Die Doppelsterne. *Not seen.*

(*Schumacher's Jahrbuch*, 1839, pp. 57–132.)

1840–1848. **Encke**, J. F., and **Galle**, J. G. (Astronomische Beobachtungen auf der Königlichen Sternwarte zu Berlin, vol. i. pp. 142–145, 1840, vol. iii. pp. 234–5, 1848.) fol. Berlin. *Not seen.*

1840. **Kaiser**, F. Ueber die Sternwarte in Leiden, und die ersten daselbst angestellten Micrometer-Messungen. (*Astr. Nachr.*, Band 18, No. 409.) *Not seen.*

1841. **Bessel**, F. W. Astronomische Untersuchungen. (vol. i. pp. 280–313.) 4to. Königsberg in Pr.

A reprint of his paper of 1835, and a paper on *p* Ophiuchi.

1841. **Struve**, F. G. W. Additamentum in mensuras micrometricas. 4to. St. Pétersbourg.

(*St. Pétersbourg Acad. Mems. Math. et Phys.*, vol. iv. pp. 337–358.)

45 Double Stars. See also the St. Pétersbourg Bulletin, vol. vi. No. 11, 1840.

Also published separately in 4to. Petropoli, 1840.

1842. **Doppler**, Christian A. Ueber das farbige Licht der Doppelsterne, etc. 4to. Prag. *Not seen.*

(*Abhandlungen der K. böhm. Gesells. der Wissenschaften*, vol. ii. p. 465.)

1842. **Mädler**, J. H. Measures of Double Stars, etc.

(*Beobachtungen der K. U. Sternwarte.* 4to. Dorpat, Bd. 9.)

Measures 1840–1841, pp. 37–60.

Orbits „ pp. 80–207.

Continued in each part of volumes x.–xv., 1843–1863.

1843. **Dien**, C. Tables donnant les Mesures Micrométriques de plus de 500 Étoiles Doubles et Multiples. 4to. Paris. *Not seen.*

1843. **Mädler**, J. H. Double Star Measures.

(*Beobachtungen der K. U. Sternwarte*, Dorpat, Bd. 10.)

Results of Measures made in 1842, pp. 31–60.

Formulæ for Motion of Double Stars, pp. 83–97.

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1843. **Santarelli**, Michele. 4to. Roma.

(*Mem. intorno a . . . osservazioni fatte nella specola dell' Università Gregoriana in Collegio Romano.*)

Contains a table of the angles and distances of 104 Double Stars, chiefly derived from Dorpat observations. *Not seen.*

1843. **Struve** (F. G. W.). Catalogue d'Étoiles Doubles et Multiples découvertes sur l'hémisphère céleste boréal par la grande lunette de Poulkova. fol. St. Pétersbourg.

514 new close pairs indicated by the symbol "OΣ," and 256 wide pairs.

Nearly all northern stars.

Revised in 1853.

1844. **Smyth**, (Admiral W. H.). A Cycle of Celestial Objects. 2 vols. 8vo. London.

The second volume of this very well-known work contains the Bedford Catalogue of 680 multiple stars with measurements and approximate places for 1840.

See also his "Ædes Hartwellianæ." 4to. London, 1851, p. 284.

1845. **Mädler**, J. H. Double Star Results, 1843–4.

(*Beobachtungen der K. U. Sternwarte*, Dorpat, Bd. 11.) 4to.

Observations of stars of the Dorpat Catalogue, pp. 3–48, and pp. 95–139.

Observations of the close stars of the Pulkowa Catalogue of 1843, pp. 49–66.

1846–48. **Mitchel**, O. M. New Double Stars.

These appeared in the "Sidereal Messenger," vol. i., 1846–1847; vol. ii., 1847–1848; and vol. iii. No. 1, 1848. *Not seen.*

The above were all the numbers that appeared. They are now very scarce, and no copies are to be found in South Africa.

The particulars of the stars found and measured by Mitchel have been republished by Prof. Ormond Stone in 1876.

1847. **Herschel**, Sir J. F. W. Results of Astronomical Observations made during the years 1834, 5, 6, 7, 8, at the Cape of Good Hope. 4to. London.

The sections on Double Stars in this work are to the Southern Heavens what Struve's Mensuræ Micrometricæ are to the Northern Heavens.

The chapter on Double Stars is divided into two parts:—

"Reduced Observations of Double Stars made with the 20-feet Reflector at Feldhausen, C. G. H., in the years 1834–1838."

This includes the new Double Stars *h* 3347 to *h* 5449, with observations of known pairs giving magnitudes, R.A. and N.P.D. for 1830, angles and (generally) estimates of distances.

"Micrometrical Measures of Double Stars with the Seven-feet Equatorial, taken at Feldhausen, C. G. H."

This section gives measures of those pairs in the preceding part which are bright enough for observation with the refractor, which had an aperture of five inches.

The co-ordinates (R.A. and N.P.D.) in this great work are very reliable, and, considering the lack of extensive southern catalogues of stars, are a monument to the younger Herschel's perseverance and thoroughness.

The angles of the pairs are all through of high excellence. Herschel compares his refractor and reflector angles, and gives a table to reduce one to the other. Herschel preferred his refractor-measures; Prof. See, however, considers the reflector-measures more reliable. This point still seems well worthy of thorough examination.

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1847. **Hind**, J. R., and others. Observations and Orbits of γ Virginis and other stars. 4to. London.

(*Mems. R. A. S.*, vol. xvi. pp. 19–22, 291–294, 461–463.)

Three short memoirs.

1847. **Jacob**, W. S. Double Stars observed at Poonah in 1845–6. 4to. London.

(*Mems. R. A. S.*, vol. xvi. pp. 311–322.)

108 measures, many of southern stars made with a (4-inch) refractor, with a postscript on the orbits of four double stars.

See also his memoir published in 1849.

1847–48. **Mädler**, J. H. Untersuchungen über die Fixstern-Systeme. 2 vols. fol. Mitau und Leipzig. *Not seen.*

1849. **Jacob**, W. S. Catalogue of Double Stars, deduced from Observations made at Poona from November 1845 to February 1848. 4to. London.

(*Mems. R. A. S.*, vol. xvii. pp. 79–91.)

Contains reduced measures of 244 stars including those published by him in 1847; elements of α Centauri; and a supplement containing the separate observations of those pairs suspected to be in motion, and on the colours of double stars.

1850. **Herschel**, Sir J. F. W. On the Determination of the most probable Orbit of a Binary Star. 4to. London.

(*Mems. R. A. S.*, vol. xviii. pp. 47–68.)

Gives a method of determining the orbit of a double star, chiefly from position angles, by arithmetrical processes only; the paper in *Mems. R. A. S.*, vol. v., describes a purely graphical process.

1850. **Mädler**, J. H. Uebersichts-Tafel der Doppelsterne von erkannter Bewegung. 4to. Dorpat.

(*Beobachtungen der K. Univ. Sternwarte*, Dorpat, vol xii., at end.)

663 stars from Struve's *Mens. Micrometricae.*

1850. **Mädler**, J. H. Berechnungen der Doppelstern-Bewegungen.

(*Beobachtungen der K. U. Sternwarte*, Dorpat, vol. xii. pp. 61–110.)

Second addition to his *Untersuchungen über die Fixstern-systeme.*

1851. **Dawes**, W. R. Micrometrical Measurements of Double Stars, made at Ormskirk between 1834·0 and 1839·4. 4to. London.

(*Mems. R. A. S.*, vol. xix. pp. 191–212.)

Including measures of a few pairs south of the Equator. 98 Pairs.

Made partly with the 3·8-inch refractor, and partly with a 6¼-inch reflector.

1851. **Maclear**, Thomas. Micrometrical Measures of Double Stars. 8vo. London.

(*M. N. R. A. S.*, vol. xi. p. 39.)

Measures of 10 Southern pairs, one of which, ϵ Canis Majoris, is new.

1852. **Doppler**, Christian A. Weitere Mittheilungen meine Theorie des farbigen Lichtes der Doppelsterne betreffend.

(*Vienna K.K. Acad., Sitzungsberichte*, vol. viii. p. 91.) *Not seen.*

Appended is a list of 13 treatises on coloured stars, or on the perception of colour.

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1852. **Hind**, J. R. Astronomical Observations taken at Mr George Bishop's Observatory. 4to. London.

Observations of 252 Double Stars during 1839–1851.
Catalogue made chiefly by W. R. Dawes.

1852. **Struve**, F. G. W. Stellarum fixarum imprimis Duplicium et Multiplicium positiones mediae. fol. Petropoli.

Mean places of 2874 Stars, mostly double, for the epoch 1830. Cited as "Pos. Med."

1853. **Struve**, Otto W. Catalogue revu et corrigé des Étoiles Doubles et Multiples découvertes à l'Observatoire centrale de Poulkova. 4to. St. Pétersbourg.
(*St. Pétersbourg Acad. Mems.*, vol. vii.)

1854. **Fletcher**, Isaac. Results of Micrometrical Measurements of Double Stars, made at Tarn Bank, Cumberland, from 1850·2 to 1853·4. 4to. London.
(*Mems. R. A. S.*, vol. xxii. pp. 167–188.)

It also includes measures of double stars made in 1851–53 by J. F. Miller.
Very few southern pairs are included.

1854. **Jacob**, W. S. Observations of 144 Double or Multiple Stars, made at the Madras Observatory, with the Lerebours Equatorial in 1850–52. 4to. Madras.
(*Astronomical Observations made at Madras*, 1848–1852, pp. 57–77.)

Nearly all south of the equator.

1854. **Jacob**, W. S. 105 Double Stars observed with the Lerebours Equatorial. 4to. Madras.
(*Astronomical Observations made at Madras*, 1848–1852, appendix, pp. (3) to (18).

A continuation of Jacob's valuable work, mostly on stars in the Southern Hemisphere.

1855. **Struve**, Otto. Résultats d'observations faites sur des étoiles doubles artificielles. 4to. St. Pétersbourg.
(*Bulletin de la classe physico-mathématique de l'Académie des Sciences de St. Pétersbourg*, vol. xiii. col. 33.)

See also vol. xvii. col. 225, 1859.
These and other papers on the same subject are collected in the "Mélanges mathématiques . . . tirés du Bulletin." 8vo. St. Pétersbourg, vol. ii., 1859, and vol. iv., 1872.

1856. **Mädler**, J. H. Double Star Measures, 1846–1853, etc. 4to. Dorpat.
(*Beobachtungen der K. U. Sternwarte, Dorpat*; vol. xiii. pp. 3–180.)

Observations with many notes.

1856. **Secchi**, Angelo. Osservazioni di Stelle Doppie. 4to. Roma.
(*Memorie dell' Osservatorio del Collegio Romano*, 1852–55, pp. 25–70.)
Measures of a variety of stars made with a 9·6-inch Merz Equatorial. See also under 1859.

1856–1878. **Dembowski**, Ercole. Measures of Double Stars.
(*Astr. Nachr.*, Band 42, No. 999, to Band 92, No. 2195.)
These valuable series of measures have been collected and published in two volumes. See under 1883–1884.

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1857. **Clark,** Alvan. New Double Stars discovered by; with appended remarks by W. R. Dawes. 8vo. London.

(*Monthly Notices R. A. S.*, vol. xvii. pp. 257–259.)

12 close pairs, 8 south of the Equator. See continuation under 1860.

1857. **Powell,** E. B. Observations of Double Stars taken at Madras in 1853, 4, 5, and the beginning of 1856. 4to. London.

(*Mems. R. A. S.*, vol. xxv. pp. 55–97.)

Measures of 130 double or multiple stars.
This memoir includes many southern stars.
The measures are mostly of angle, few distances being given.
An important paper.

1858. **Smyth,** C. Piazzi. Report on the Teneriffe Astronomical Experiment of 1856, addressed to the Lords Commissioners of the Admiralty. 4to. London and Edinburgh.

Chaps. I. to V. (paged 465–533), with plates 30 to 39, are identical with the corresponding portions of the *Phil Trans.* for 1858; the two remaining chapters, with title-page, preface, contents, index, photo-stereograph vignette, and one photograph, complete the work as issued separately.

1858. **Smyth,** C. Piazzi. Teneriffe, an Astronomer's Experiment. . . . 8vo. London.

An altogether charming popular account of the important Teneriffe expedition.
The details of the Experiments and Observations, including notes on the colours of double stars, will be found in vol. xii. of *Astronomical Observations made at Edinburgh.* 4to. 1863, pp. 401–514, with 5 photographs.

1859. **Pogson,** N. R. On the Ocular Crystal Micrometer, with observations of twelve double stars. . . . 8vo. London.

(*British Association Report for* 1858.) *Not seen.*

Of the twelve stars only ζ Aquarii is south of the equator.

1859. **Mädler,** J. H. Beobachtungen der K. U. Sternwarte, Dorpat. Band 15, Abth. 1. 4to. Dorpat.

Doppelstern-Messungen, 1853–1858, pp. 1–35.
Nachtrag, pp. 59–100.

1859. **Secchi,** A. Misure di Stelle Doppie, pp. 33–144. Appendix to same, pp. 169–176. 4to. Roma.

(*Memorie dell' Osservatorio del Collegio Romano Nuova Serie*, 1857 al 1859.)

A continuation of his measures with a resumé—A fair number of southern pairs.

1859. **Webb,** T. W. Celestial Objects for Common Telescopes. Small 8vo. London.

2nd ed., 1868, 3rd ed., 1873, 4th ed., 1881, each in one volume, 5th ed. in two volumes, by **Espin.** 1894.

One of the best works for the amateur astronomer; in the last edition, the 2nd volume is entirely devoted to double stars, those north of — 23° being arranged in constellations.

1860. **Clark,** Alvan. New Double Stars discovered by. Communicated by W. R. Dawes. (*Second Series.*) 8vo. London.

(*M. N. R. A. S.*, vol. xx. p. 55.)

Nos. 13 to 20. All north of the equator.

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1860. **Gubbins,** C. Catalogue of Multiple Stars observed in Upper India in 1855–6. 8vo. London.

(*M. N. R. A. S.*, vol. xx. pp. 20–22.)

The observations were made with a 3½-inch refractor.

The details were never published, the author's paper being "deposited in the archives of the Society." The stars, 122 in number, seem all to have been south of the equator. *Not seen.*

1860. **Jacob,** W. S. Micrometrical Measures of 120 Double or Multiple Stars taken at the Honourable East India Company's Observatory at Madras, in the years 1856–58. 4to. London.

(*Mems. R. A. S.*, vol. xxviii. pp. 13–47.)

A continuation of his previous observations. Three new pairs are included, one of which was detected through an occultation by the moon.

A very valuable list containing measures of 120 pairs, the greater part being south of the equator.

A preliminary notice of the above list will be found in *M. N. R. A. S.*, vol. xix., No. 2, December 1858.

1860. **Secchi,** A. Catalogo di 1321 Stelle Doppie misurate col grande Equatoriale di Merz all' Osservatorio del Collegio Roma. 4to. Roma.

(*Atti dell' Accademia Pontificia de' Nuovi Lincei*, vol. xiii.)

Stars from Struve in five orders of distances.

See also vol. xiv., p. 1, 1861.

1860. **Smyth,** Admiral W. H. The Cycle of Celestial Objects continued at the Hartwell Observatory to 1859. 4to. London.

Known also as "Speculum Hartwellianum."

Chapters on Colours of Double Stars, Orbit of γ Virginis, etc.

1861. **Wrottesley,** Lord. A Catalogue of the Positions and Distances of 398 Double Stars. 4to. London.

(*Mems. R. A. S.*, vol. xxix. pp. 85–168.)

A series of measures made with a 7¾-inch refractor, between the years 1843–1859, by Messrs Simms, Philpott and Morton.

Although mostly Struve stars, a fair proportion are south of the equator. Some of these measures have been used, and are referred to by the name of the actual observer.

1862. **Auwers,** G. F. J. Arthur. Untersuchungen über veränderliche Eigenbewegung. Erster Theil. Inaugural-Dissertation. 4to. Königsberg.

Contains investigations of the proper motions of some double and other stars. *Not seen.*

1862–1877. **Main,** Robert. Measures of Double Stars. 8vo. Oxford.

(In *Radcliffe Observations*, vols. xx–xxxvi.)

1863. **Mädler,** J. H. Beobachtungen der K. U. Sternwarte, Dorpat. Band 15; Theil. 2. 4to. Dorpat.

Measures in 1859–1862, with means, pp. 1–28.

Comparison between his measures and those of Auwers with the Königsberg Heliometer, pp. 28–32.

Remarks on a few double stars, pp. 51–66.

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1864. **Mitchell**, Maria. Observations on some of the Double Stars.

(*American Journal of Science and Arts*, 2nd ser. vol. xxxvi.) *Not seen.*

Measures and notes of colours of 36 stars with a 5-inch Clark Refractor, 1859–63.

[1864.] **Powell**, E. B. Second Series of Observations of Double Stars taken at Madras in 1859–62. 4to. London.

(*Mems. R. A. S.*, vol. xxxii. pp. 75–95.)

56 double stars, about half being south of the equator. Followed by notes.

The observations were made with a 4-inch equatorial.

1864. **Schjellerup**, H. C. F C. Stjernefortegnelse indeholdende 10,000 Positioner af teleskopiske Fixstjerner imellem −15 og + 15 Graders Deklination. 4to. Kjöbenhavn.

In the introduction, pp. xxiv–xxv, will be found a list of 36 new double stars: those with South Declination are included here under the designation Schjellerup$_2$.

A preliminary list containing the greater number of these stars will be found in the *Astr. Nachr.*, Band 62, No. 1485; 1864.

1864. **Smyth**, Admiral W. H. Sidereal Chromatics. 8vo. London.

On the colours of double stars, written in Admiral Smyth's delightful style. An amplification of a chapter in his Speculum Hartwellianum.

1865. **Engelmann**, R. Messungen von 90 Doppelsternen am sechsfüssigen Refractor. 8vo. Leipzig.

(See also *Astr. Nachr.*, Band 64, p. 81.)

1865. **Kaiser**, F. 4to. Doppelstern-Messungen, 1840–1844. 4to. Altona.

(*Astr. Nachr.*, Band 64, p. 97.)

See also *Annalen der Sternwarte in Leiden*, Band 3, p. 179, 1872.

1865, '70, '73. [Romberg, H., and Talmage, C. G.] Astronomical Observations taken during the years 1862–72, at the Private Observatory of Joseph Gurney Barclay, Esq., F.R.A.S., at Leyton, Essex. Vols. i.–iii. 4to. London.

Measures of 92, 217, and 91 double stars, respectively.

Before 1864 the observations were made by H. Romberg, and afterwards by C. G. Talmage.

1867. **Brothers**, A. Catalogue of Binary Stars, with Introductory Remarks. 8vo. Manchester.

(*Mems. of the Literary and Philosophical Society of Manchester*, 3rd ser. vol. iii. pp. 204–230.)

Also presented with *Astronomical Register*, vol. v.; which see p. 96.

197 binary or doubtful binary stars, with selections of measures *Not seen.*

The author's measures of 8 stars are given in the Remarks.

1867. **Dawes**, W. R. Catalogue of Micrometrical Measurements of Double Stars. 4to. London.

(*Mems. R. A. S*, vol. xxxv. pp. 137–502.)

A most valuable paper containing all his measures from 1839–1865.

With copious notes and hints on observing, and on various micrometers and screens, together with remarks on many of the pairs measured.

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1867. **Herschel,** Sir J. F. W. A Synopsis of all Sir William Herschel's Micrometrical Measurements and Estimated Positions and Distances of the Double Stars described by him, together with a Catalogue of those Stars in order of Right Ascension, for the epoch 1880·0, so far as they are capable of identification. 4to. London.

(*Mems. R. A. S.*, vol. xxxv. pp. 21–136.)

After giving the stars of ℍ's six classes, and his last *new* list published in 1822, *h* arranges all in order of R.A., numbering them from 1 to 812. These numbers, prefixed by the initials H*h*, are sometimes used for ℍ stars in place of the original classes and numbers, which are retained in this catalogue.

1868. **Secchi, A.** Serie seconda delle misure micrometriche . . . dal 1863 al 1866 inclusive. Stelle doppie e nebulose. 4to. Roma.

(*Atti dell' Accademia Pontificia de'Nuovi Lincei*, vol. xxi. p. 159.) *Not seen.*

Measures of 159 double stars, and of 3 planetary nebulæ.

1869. **Copeland,** Ralph. Ueber die Bahnbewegung von *α* Centauri. Inaugural-Dissertation. 8vo. Göttingen.

Contains a discussion of the earlier observations of the great binary.

Reviewed by A. Winnecke in *Vierteljahrsschrift der Astr. Ges.*, v. Jg. p. 312.

1869. **Lamont,** J. von. Messungen an Sternen, welche sehr kleine Begleiter haben, und an einigen bekannten Doppelsternen. 8vo. München.

(*Annalen der K. Sternwarte bei München*, Band xvii.)

1869. **Winnecke,** A. Doppelsternmessungen. 4to. Altona.

(*Astr. Nachr.*, Band 73, No. 1738.)

Chiefly made with the 9·6-inch refractor at Berlin in 1855–6.

1869–1873. **Ellery,** R. L. J. Results of Astronomical Observations made at the Melbourne Observatory, 1866–1868 and 1869–70. 2 vols. 8vo. Melbourne.

Several new pairs were taken from the meridian observations in these volumes.

1870. **Gore,** J. E. Southern Stellar Objects between the Equator and 55° South Declination. 8vo. Calcutta.

Reprinted 1877. *Not seen.*

1871. **Gilliss,** J. M. A Catalogue of . . . 290 Double Stars observed by U.S. Naval Astronomical Expedition . . . during 1850–'51–'52. 4to. New York.

Originally published as part of an appendix to the Washington Observations for 1868.

A few new southern pairs will be found in this list. They were noted with the meridian instrument erected at Santiago in Chile, not being specially looked for.

1871. **Herschel,** Sir J. F. W. Seventh Catalogue of Double Stars observed at Slough. 4to. London.

(*Mems. R. A. S.*, vol. xxxviii. pp. 1–16.)

368 stars, observed in the years 1823–1828 inclusive, of which 84 are new.

Contains *h* 5450 to *h* 5533.

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1872. **Talbot**, H. Fox. On a Method of Estimating the Distances of some of the Fixed Stars. 8vo. London.

(*Report of the British Association*, 1871, pp. 34–36.)

The method proposed is founded on Spectral Analysis, and has been the subject of many papers since this date.

1873. **Burnham**, S. W. Catalogue of 81 Double Stars, discovered with a 6-inch Alvan Clark Refractor. 8vo. London.

(*M. N. R. A. S.*, vol. xxxiii. pp. 351–357.)

The first of Burnham's celebrated series of catalogues of new double stars. These catalogues are rich in southern pairs of the most interesting character.

Contains β 1 to β 81, all but one (β 64), found with a 6-inch refractor made by Alvan Clark, now at the Washburn Observatory.

1873. **Burnham**, S. W. A Second Catalogue of New Double Stars, discovered with a 6-inch Alvan Clark Refractor. 8vo. London.

(*M. N. R. A. S.*, vol. xxxiii. pp. 437–439.)

Contains β 82 to β 106.

1873. **Burnham**, S. W. A Third Catalogue of 76 New Double Stars, discovered with a 6-inch Alvan Clark Refractor. 8vo. London.

(*M. N. R. A. S.*, vol. xxxiv. pp. 59–71.)

Contains β 107 to β 182.

1873–4. **Burnham**, S. W. "Errors and Omissions" and "Additional Notes" concerning Sir William Herschel's Double Stars. 8vo. London.

(*M. N. R. A. S.*, vols. xxxiii. pp. 567–570 and xxxiv. pp. 98–103.)

Notes on stars about which there is some uncertainty.

1874. **Burnham**, S. W. A Fourth Catalogue of 47 New Double Stars, discovered with a 6-inch Alvan Clark Refractor. 8vo. London.

(*M. N. R. A. S.*, vol. xxxiv. pp. 382–392.)

Containing β 183 to β 229.

1874. **Herschel** (**Main** and **Pritchard**). A Catalogue of 10,300 Multiple and Double Stars arranged in the order of Right Ascension.

(*Mems. R. A. S.*, vol. xl. pp. 1–144.)

Places for 1830. No angles, distances, or magnitudes of the components.

10,317 double and multiple stars, with many notes.

1874. **Niven**, C. On a Method of finding the Parallax of Double Stars, and on the Displacement of the Lines in the Spectrum of a Planet.

A list of double stars, showing the best times for their spectroscopic examination, is given.

1875. **Burnham**, S. W. A Fifth Catalogue of 71 New Double Stars. 8vo. London.

(*M. N. R. A. S.*, vol. xxxv. pp. 31–49.)

Containing β 230 to β 300 found with telescopes (refractors) of 6-inch, 9·4-inch, 18½-inch, and 26-inch aperture.

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1875. **Burnham,** S. W. Sixth Catalogue of 90 new double stars discovered with a 6-inch refractor. 4to. Kiel.

(*Astr. Nachr.*, Band 86, No. 2062.)

Containing β 301 to β 390.

1875. **Doberck,** W. New Elements of μ_2 Bootis. 4to. Kiel.

(*Astr. Nachr.*, Band 85, No. 2026.)

The first of a long series of papers on double stars, which include measures, orbits, colours, theories, etc. Here it has been impossible to enumerate all the papers, but the more important from the point of view of this catalogue will be noticed.

1875. **Doberck,** W. On the Binary Stars σ Coronae, τ Ophiuchi, γ Leonis, ζ Aquarii, 36 Andromedae, and ι Leonis.

(*Transactions of the Royal Irish Academy*, vol. xxv.) *Not seen.*

1875. **Ferrari,** G. S. Serie terza delle misure micrometriche delle stelle doppie fatte all' equatoriale del Collegio Romano . . . 1872–4. 4to. Roma. *Not seen.*

(*Atti dell' Accademia Pontificia de' Nuovi Lincei*, vol. xxviii. pp. 207–228.)

1875. **Gledhill,** J. Measures of 484 Double Stars, made at Mr Edward Crossley's Observatory, Bermerside, Halifax. 4to. London.

(*Mems. R. A. S.*, vol. xlii. pp. 101–127.)

Measures of 484 stars made with a 9½-inch refractor by Cooke.

1875. **Nobile,** A. Misure di angoli di posizione di alcuni sistemi di stelle multiple. 4to. Napoli. *Not seen.*

(*Rendiconto dell' Accademia delle scienze fisiche e matematiche.* Anno xiv. pp. 9–21, 1875.)

1875. **Wilson,** J. M., and **Seabroke,** G. M. Catalogue of Micrometrical Measurements of Double Stars, made at the Temple Observatory. 4to. London.

(*Mems. R. A. S.*, vol. xlii. pp. 59–100.)

Measures of 447 double stars with the well-known 8½-inch refractor, originally made by Alvan Clark for Dawes.

1876. **Bessel,** F. W. Abhandlungen, herausgegeben von R. Engelmann, vol. ii. pp. 282–299. 4to. Leipzig.

Reprints of various papers on Double Stars.

1876. **Burnham,** S. W. Seventh Catalogue of New Double Stars. 4to. Kiel.

(*Astr. Nachr.*, Band 88, No. 2103.)

Containing β 391 to β 436.

1876. **Burnham,** S. W. A Catalogue of Red Double Stars. 8vo. London.

(*M. N. R. A. S.*, vol. xxxvi. pp. 331–338.)

A list of 102 red double stars within 121° of the North Pole.

1876. **Copeland,** Robert. A Summary of the *Mensuræ Micrometricæ* of Struve. 4to. Dun Echt, Aberdeen.

(*Lord Lindsay's Dun Echt Observatory Publications*, vol. i.)

A very convenient summary of Struve's measures. Struve's great volume is too large for practical use, and is now very scarce. Besides which, the arrangement of the stars in classes is inconvenient. In the above work the stars are arranged in order of R.A. for 1875.

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1876. **Dunér**, N. Mesures Micrométriques d'Étoiles Doubles. 4to. Lund.

A valuable collection of observations made at Lund from 1867–1875 with a 9¾-inch refractor. Nearly all the stars measured are north of the Equator, and thus do not come within the scope of this catalogue.

1876. **Howe**, Herbert A. Catalogue of 50 New Double Stars, discovered with the 11-inch Refractor. 8vo. Cincinnati.

(*Publications of the Cincinnati Observatory*, No. 1.)

Fifty new pairs (Howe 1 to Howe 50) all south of the Equator, with right ascensions and declinations for 1880.

Later pairs found by the same observer have not been regularly numbered.

1876. **Knobel**, E. B. Reference Catalogue of Astronomical Papers and Researches. 8vo. London.

(*M. N. R. A. S.*, vol. xxxvi. pp. 365–392.)

Mr Knobel starts this paper as follows:—"A Catalogue of Scientific Papers, classified according to subjects, is a desideratum and a necessity to exhaustive scientific research. . . . . I have made an attempt to supply this want, for a few branches of Stellar Astronomy, by a series of references to all books, papers, and notes relating to the following subjects:—

"1. Double Stars, including the Mathematical Investigation of the Orbits of Binary Systems.
"2. Variable Stars.
"3. Red Stars.
"4. Nebulæ and Clusters.
"5. Proper Motions of Stars.
"6. Parallax and Distance of Stars.
"7. Star Spectra."

Mr Knobel's paper has been of considerable use in this compilation.

1876. **Mitchel**, O. M. Micrometrical Measures of 176 Double and Triple Stars, observed with the 11-inch Refractor of the Cincinnati Observatory. 8vo. Cincinnati.

(*Publications of the Cincinnati Observatory*, No. 2.)

Measures, chiefly of southern pairs, made by several observers, but in greater part by Mitchel. Several new pairs will be found in this list.

See also under 1846–48.

The above measures have been reduced under the direction of Prof. Ormond Stone.

1877. **Burnham**, S. W. Double-Star Discoveries with the 18½-inch Chicago Refractor. 8vo.

(*American Journal of Science*, vol. cxiv. pp. 31–35.)

His eighth catalogue, containing β 437 to β 452: all north of the Equator.

1877. **Burnham**, S. W. Ninth Catalogue of New Double Stars, discovered with the 6-inch Refractor. 8vo. London.

(*M. N. R. A. S.*, vol. xxxviii. pp. 78–80.)

Containing β 453 to β 482, and including twelve southern pairs.

1877. **Gore**, J. E. Southern Stellar Objects for Small Telescopes. *Not seen.* (See under 1870.)

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1877. **Knott,** George. Micrometrical Measures of Double Stars. 4to. London.
(*Mems. R. A. S.*, vol. xliii. pp. 75–104.)

309 double stars measured between 1860 and 1873 with the 7½-inch telescope formerly belonging to the Rev. W. R. Dawes.

A considerable number of southern pairs is included.

The measures seem to be very good, and great attention was given to magnitudes and colours.

1877. **Schiaparelli,** G. V. Mesures micrométriques de quelques étoiles doubles plus importantes. 4to. Kiel.
(*Astr. Nachr.*, Band 89, Nos. 2132–3.)

Made in 1875–1877.

1877. **Stone,** E. J. Results of Astronomical Observations made at the Royal Observatory, Cape of Good Hope. 1874. 8vo. Cape Town.

From this and subsequent volumes of the same series several new double stars have been taken. As in most meridian work, the direction of the companion and its magnitude is all that is recorded.

1877. **Stone,** Ormond. Micrometrical Measurements of 166 Double and Triple Stars, observed with the 11-inch Refractor of the Cincinnati Observatory during the years 1875–76. 8vo. Cincinnati.
(*Publications*, No. 3, pp. i–iii and 1–34.)

In the introduction to this series of measures Professor Stone remarks: "The labours of European astronomers have rendered our knowledge of the double stars between the pole and 15° of south declination very complete. For our knowledge of double stars situated farther south, we are almost wholly indebted to the observations of Dunlop at Paramatta, Sir John Herschel at the Cape of Good Hope and those of Jacob and Powell at Madras. No systematic survey of the southern heavens similar to that made by Struve of the northern heavens has ever been undertaken. A large portion of Sir John Herschel's southern doubles has never been measured micrometrically, and no strictly southern observatory, as far as I am aware, has published any double star observations of recent date. It has therefore seemed to me appropriate that the 11-inch refractor of this Observatory should be devoted to supplementing the labours of other astronomers, by observations of double stars between 15° and 35° of south declination."

This indicates the course of the work clearly enough, and the series of measures thus commenced has been of great utility in the formation of the present catalogue.

The observers were Messrs Stone, Howe, and Upton.

1877. **Wilson,** J. M., and **Seabroke,** G. M. Second Catalogue of Micrometrical Measures of Double Stars, made at the Temple Observatory. 4to. London.
(*Mems. R. A. S.*, vol. xliii. pp. 105–128.)

Measures, chiefly of Struve stars.

1878. **Burnham,** S. W. New Double Stars. 8vo. London.
(*M. N. R. A. S.*, vol. xxxviii. p. 478.)

Asking for measures of some new double stars.

1878. **Doberck,** W. Binary Stars. 8vo. London.
(*The Observatory*, vol. ii. Nos. 16, 17, 18, 19.)

Mainly on computation of orbits, with examples. A slight historical sketch is given.

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1878. **Doberck,** W. On Double-Star Observations. 4to. Kiel.
(*Astr. Nachr.*, Band 92, No. 2187.)

A graphic description of the Markree Observatory, the 13·2-inch Cauchoix Refractor, and the filar micrometer, with an explanation of his method of double star observation.

1878. **Doberck,** W. Markree Double-Star Observations. 4to. Kiel.
(*Astr. Nachr.*, Band 92, Nos. 2196–7–8–9.)

Made in 1875–1878.

1878. **Doberck,** W. Values of M for different e with argument E.
Values of E for different e with argument M. 4to. Kiel.
(*Astr. Nachr.*, Band 92, No. 2202.)

1878. **Flammarion,** Camille. Catalogue des Étoiles Doubles et Multiples en mouvement relatif certain. 8vo. Paris.

A very useful work.
The lists of measures are fairly complete to the date of publication.

1878. **Gledhill,** Joseph. Double-star Measurement. 8vo. London.
(*The Observatory*, vol. ii. No. 17.)

1878. **Oxford University Observatory.** Observations of Double Stars in the years 1876 and 1877. 8vo. Oxford.
(*Astronomical Observations*, No. I. pp. 17–42.)

Observations mostly of northern stars made by Mr W. E. Plummer and Mr Jenkins with the 12¼-inch refractor.

1878. **Stone,** Ormond. Micrometrical Measurements of 517 Double Stars. 8vo. Cincinnati.
(*Publications of the Cincinnati Observatory*, No. 4, pp. i–ix and 1–74.)

The observations of 1877 in continuation of those in publication No. 3. All are southern pairs.

1878. **Struve,** Otto. Observations de Poulkova. 4to. St. Pétersbourg. Vol. ix., Mesures Micrométriques des Étoiles Doubles.

In this most interesting work unfortunately very few southern stars come under consideration.
The introduction contains a very full description of the methods for determining the screw-value of the micrometer, measures of artificial double stars, empirical formulæ for the correction of measures of angle and distance, comparisons between the measures of several astronomers, etc.

1878. **Talmage,** C. G. Double Star Observations. 4to. London.
(*Astronomical Observations taken to the end of* 1877, *at the Private Observatory of Joseph Gurney Barclay, Esq., F.R.A.S., Leyton, Essex*, vol. iv. pp. 1–98.)

Made with a 10-inch Cooke Refractor. Contains a summary of all the Leyton measures.

1878. **Waldo,** Leonard. Miscellaneous Observations of Double Stars made in 1876 at the Observatory of Harvard College. 4to. Kiel.
(*Astr. Nachr.*, Band 92, No. 2190.)

Made with the 15-inch Merz Refractor.
The only southern stars are γ Virginis and τ Ophiuchi.

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1879. **Brünnow,** Francis. Observations of Double Stars. 4to. Dublin.
(*Dunsink Observations*, Third Part, No. 4, pp. 71–85.)

1879. **Burnham,** Sherburne Wesley. Double Star Observations made in 1877–8 at Chicago, with the 18½-inch Refractor of the Dearborn Observatory, comprising: I. A catalogue of 251 New Double Stars with Measures; II. Micrometrical Measures of 500 Double Stars. 4to. London.
(*Mems. R. A. S.*, vol. xliv. pp. 141–305.)

See also an advance note on this paper in *M. N. R. A. S.*, vol. **xxxix.** p. 76 (1878).
Includes Burnham's tenth catalogue of new stars, β 483 to β 733.
A very valuable paper.
In the *M. N. R. A. S.*, vol. xl. pp. 99–102 (1879) a preliminary list of additional new pairs is added.

1879. **Doberck,** W. Markree Double Star Observations. 4to. Kiel.
(*Astr. Nachr.*, Band 94, No. 2242.)

On the Brightness and Parallax of Double-Stars. 4to. Kiel.
(*Astr. Nachr.*, Band 95, No. 2269.)

On the Colour of Revolving Double-Stars, etc. 4to. Kiel.
(*Astr. Nachr.*, Band 95, No. 2278.)

1879. **Goldney,** Gabriel A. Double-Stars observed at the University Observatory, Durham, during the year 1878. 4to. Kiel.
(*Astr. Nachr.*, Band 95, No. 2257.)

Made with a 6·3-inch equatorial and a double image micrometer.

1879. **Gould,** B. A. Uranometria Argentina. 4to. Buenos Aires.

A few pairs have been taken from this work.

1879. **Russell,** H. C. Clark's Companion of Sirius. 8vo. Sydney.
(*Proc. Roy. Soc. N. S. Wales*, 1878, pp. 233–5.)

1879. **Schur,** W. Heliometer-Messungen von Doppelsternen, 1875–76. 4to. Kiel.
(*Astr. Nachr.*, Band 94, pp. 353 and 369.)

1879. **Seeliger,** H. Ueber Mädler's Doppelsternmessungen. 4to. Kiel.
(*Astr. Nachr.*, Band 96, No. 2288.)

1879. **Stone,** Ormond. Micrometrical Measurements of 1054 Double Stars, observed with the 11-inch Refractor from January 1, 1878, to September 1, 1879. 8vo. Cincinnati.
(*Publications of the Cincinnati Observatory*, No. 5, pp. i–xxix and 1–180.)

A continuation of the previous series. The observers were Stone, Howe, and Egbert. A list of 74 new double stars is given.
The introduction contains much interesting matter on personal equation and the accuracy of observations, also a formula for the rejection of wide pairs.

1879–1880. **Crossley, Gledhill,** and **Wilson.** A Handbook of Double Stars. 8vo. London. Corrections, etc. to the same. 8vo. London.

A very useful treatise on Double Stars, appealing mainly to northern astronomers. Too well known to require description here.

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1880. **Burnham**, S. W. Catalogue of 42 New Double Stars, and Micrometrical Measures of Double Stars. 4to. Chicago.
(*Report to the Trustees of the "James Lick Trust" of Observations made on Mt. Hamilton*, pp. 21–32.) Reprinted in vol. i. of the Lick Publications.

Contains β 734 to β 775 found with his 6-inch refractor.

1880–1881. **Jedrzejewicz**, J. Mesures micrométriques des Étoiles Doubles à Plonsk. 4to. Kiel.
(*Astr. Nachr.*, Band 97, No. 2324, Band 98, Nos. 2329–2351, Band 99, No. 2369, and Band 101, No. 2407.)

1881. **Burton**, C. E. Recent Measures of Double Stars. 4to. Dublin.
(*Copernicus*, vol. i. pp. 54–56.)

1881. **Hall**, Asaph. Observations of Double Stars made at the U.S. Naval Observatory. 4to. Washington.
(*Washington Observations*, 1877, Appendix VI.)

Measures of 423 stars made with the 26-inch refractor from 1875 to 1880, a considerable number being in south declination. Also some measures with the 9·6-inch equatorial.

1881. **Holden**, E. S. List of New Double Stars. List of New Zone Doubles. 4to. Madison.
Not seen.
(Contributions from the Washburn Observatory of the University of Wisconsin, No. 1.)

The first list contains 34 doubles discovered by Burnham; in the second are 28 pairs found by Holden and Burnham. Both these lists are incorporated in the fuller lists in the publications of the Washburn Observatory. See under 1882.

1881. **Seabroke**, Geo. M. Third Catalogue of Micrometrical Measures of Double Stars made at the Temple Observatory, Rugby. 4to. London.
(*Mems. R. A. S.*, vol. xlvi. pp. 183–212.)

A continuation of similar lists by the Rev. J. M. Wilson and Mr Seabroke.

1881. **Stone**, E. J. The Cape "Catalogue of 12,441 Stars for the Epoch 1880." 4to. London.

Containing meridian observations of several wide pairs and notices of stars not previously recorded as double.

1882. **Burnham**, S. W. Hints on Double Star Observing. 8vo. Northfield, Minn.
(*The Sidereal Messenger*, vol. i. Nos. 2, 3, 4.)

No one is better qualified than Burnham to write such a paper as this, and it requires no recommendation here. So far as my limited experience goes, it entirely agrees with the principles set forth in this valuable paper. It treats of:—

The Telescope.
Refractors and Reflectors.
Driving Clock.
The Micrometer.
What to do.
New Double Stars.
Magnitudes.
Variability.
Eye-pieces.
Working List.
Record of Observations.
Amount of Work.
Methods of Observing.
Works of Reference.
Star Catalogues.

Reprinted with slight alterations in *Astronomy for Amateurs*. 8vo. London, 1888.

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1882. **Burnham**, S. W. A List of 88 New Double Stars discovered and micrometrically measured at the Washburn Observatory from April 23 to September 30, 1881. 8vo. Madison.
(*Publications of the Washburn Observatory*, vol. i. pp. 91–111.)

This is Burnham's 12th catalogue, including β 776 to β 863.

All found with the 15·6-inch Clark Refractor.

Followed by an important series of "Measures of double stars selected from his MS. General Catalogue of Double Stars." (Same volume, pp. 113–159.)

1882. **Doberck**, W. On the Poles of Double-Star-Orbits. 4to. Kiel.
(*Astr. Nachr.*, Band 102, No. 2433.)

With a table showing the poles of the orbits on both hypotheses of inclination, and also the hypothetical parallaxes.

1882. **Engelmann**, Rudolf. Messungen von Doppelsternen. 4to. Leipzig.

Measures of Σ and OΣ stars in 1864–1867.

This paper also appeared in the *Publicationen der K. Universitäts-Sternwarte zu Leipzig.* Heft 1.

See also *Astr. Nachr.*, Bd. 70, Nos. 1673–76, 1868.

1882. **Harvard College Observatory.** Double Stars. 4to. Cambridge, Mass.
(*Annals of the Astronomical Observatory of Harvard College*, vol. xiii., part i., chap. ii. pp. 17–61.)

Table VI. New Double Stars.

,, VII. Micrometric Measurements of Double Stars.

Observations by Winlock, C. S. Peirce, Searle, and others.

The new double stars, 179 in number, were discovered with the 15-inch refractor between 1866 and 1881. The greater portion are southern stars, mostly wide and faint, and the positions are in some cases too rough to permit identification. The celebrated binary ζ Sagittarii is in this list. Several of the stars were independently found later on by Burnham, and were first published by him.

The measures of double stars were chiefly made from 1866 to 1871, and include a considerable number of southern pairs.

1882. **Houzeau**, J. C. Vade-Mecum de l'Astronome. 8vo. Bruxelles.

A most useful work, of which pp. 889–905 are devoted to Double Star Astronomy.

1882. **Jedrzejewicz**, J. Mesures micrométriques des étoiles doubles à Plonsk. (2^{e} Série). 4to. Kiel
(*Astr. Nachr.*, Band 103, Nos. 2449–50.)

Made in 1880–1882. Stars selected from the Struve catalogues.

1882. **Russell**, H. C. Results of Double Star Measures made at the Sydney Observatory, 1870 to 1881. 8vo. Sydney.

(The official reprint of a paper published by the Royal Society of N. S. Wales, 1881, pp. 1–68.)

This paper was also published in the *Memoirs R. A. S.*, vol. xlvii., 1883, but there are many small differences; here the official publication has been used in preference.

A valuable series of measures of known double stars (mostly from *h*) nearly all south of Dec. $-34°$ made by Mr Russell and Mr L. Hargrave with refractors of $7\frac{1}{4}$ and $11\frac{1}{2}$ inches,

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followed by a list of 350 new double stars. Unfortunately this work suffers much from misprints and other errors. In the observations of the new double stars, the name of the observer has not been recorded; here it has been assumed to be Mr Russell, except in one or two cases where there is other evidence that Mr Hargrave was the observer.

In the work itself the new stars, where referred to, have the initial R prefixed, but in the more recent Sydney Observations this is changed to Syd_1.

1882. **Shdanow**, A. Zur Berechnung der Doppelsternbahnen. 4to. Kiel.
(*Astr. Nachr.*, Band 103, No. 2469.)

1882. **Stone**, Ormond. Micrometrical Measurements of 455 Double Stars observed with the 11-inch Refractor during the year ending September 1, 1880. 8vo. Cincinnati.
(*Publications of the Cincinnati Observatory*, No. 6, pp. i–iv and 1–69.)

A continuation of the measures in previous years by the same observers (Stone, Howe, and Egbert). About half the stars are north of the equator.

1882. **Thiele**, T. N. On some Interpolation Formulæ for Double Stars. 4to. Dublin.
(*Copernicus*, vol. ii. pp. 25–41.)

A mathematical paper.

1882. **Washburn Observatory**. List of 60 New Double Stars discovered in the Zone Observations . . . from April 23 to September 30, 1881. 8vo. Madison.
(*Publications*, vol. i. pp. 77–89.)

Contains Washburn 1 to Washburn 60 found with the 15·6-inch refractor and a power of 145, mostly by Professor E. S. Holden. A considerable number of southern pairs.

1883. **Burnham**, Sherburne Wesley. Double Star Observations made in 1879 and 1880 with the 18½-inch Refractor of the Dearborn Observatory, Chicago, U.S. I. Catalogue of 151 New Double Stars with Measures. II. Micrometrical Measures of 770 Double Stars. 4to. London.
(*Mems. R. A. S.*, vol. xlvii. pp. 167–[325].)

Containing Burnham's thirteenth catalogue of new pairs, viz.: β 864 to β 1025.

Also, in an appendix, some valuable remarks on double stars. He shows that the average distance of 743 double stars, out of 1000 discovered by him, is only 1″·58.

1883. **Cruls**, L. Mesures Micrométriques d'Étoiles Doubles et Multiples de l'Hémisphère Austral. 4to. Rio.
(*Annales de l'Observatoire Impérial de Rio de Janeiro*, tome iv., partie 1, pp. [97–123].)

The volume was published in 1889, but this paper was first printed in 1883. The measures, which are chiefly of wide pairs, were made in 1879 and 1880 with a 9¾-inch refractor.

1883. **Powell**, E. B. Measures of Southern Double Stars. 8vo. London.
(*M. N. R. A. S.*, vol. xliv. pp. 17–22.)

Made between 1863–1871, completing Mr Powell's series of measures.

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1883. **Seagrave**, F. E. Double Stars. 8vo. Northfield.
(*Sidereal Messenger*, vol. ii. pp. 22–23.)

Measures made with an 8¼-inch equatorial in 1882. Thirty-seven Σ and OΣ stars.

1883. **Thiele**, T. N. Neue Methode zur Berechnung von Doppelsternbahnen. 4to. Kiel.
(*Astr. Nachr.*, Band 104, No. 2488.)

1883–1884. **Dembowski**, Ercole. Misure Micrometriche di Stelle Doppie e Multiple fatte negli anni 1852–1878. 2 vols. 4to. Roma.

These two volumes contain the collected measures of Baron Dembowski, edited by Otto Struve and G. V. Schiaparelli.

Dembowski's measures extend to all known double stars from the North Pole to about −20° declination. Their value is too well known to require comment here.

1883–1886. **Perrotin**, J. Mesures Micrométriques d'Étoiles Doubles faites à l'Observatoire de Nice (Équatorial de Gautier de $0^{m}{\cdot}38$ d'ouverture).

1e Série, *Astr. Nach.*, Band 106, No. 2529.
2e „ „ „ 107 „ 2559–60.
3e et 4e Séries, „ „ 112 „ 2684–85.
5e Série, „ „ 115 „ 2748–49.

The third series also appeared in vol. i. of the *Bulletin Astronomique*.

All stars from Σ's or OΣ's catalogues.

1884. **Bigourdan**, G. Sur une Cause d'Erreurs Systématiques dans les mesures d'Étoiles Doubles. 8vo. Paris.
(*Bulletin Astronomique*, vol. i. pp. 439–445.)

1884. **Copeland**, Ralph. Experiments in the Andes. 4to. Dublin.
(*Copernicus*, vol. iii. pp. 193–231.)

On pp. 199–201 of this most interesting account of mountain observations will be found the double star results with a 6-inch refractor. The new pairs ψ Argûs (a rapid binary) and ε Lupi were discovered on this occasion.

1884. **Downing**, A. M. W. On an Instance of Change of Personality in Observing Position Angles of Double Stars; and on the Orbit of α Centauri.
(*M. N. R. A. S.*, vol. xliv. pp. 238–240.)

The Change of Personality occurs in the Sydney observations of α Centauri, and amounts to 5° or 6°.

1884. **Franz**, J. Heliometermessungen von Doppelsternen zu Königsberg. 4to. Kiel.
(*Astr. Nachr.*, Band 108, No. 2590.)

1884. **Gould**, B. A. Cordoba Zone Catalogue. 2 vols. 4to. Cordoba.

A large number of double stars are to be found in this great work, and many were new at the time of observation. It is hoped that all the closer pairs, not elsewhere previously recorded, have been given in the Reference Catalogue. To those who care to give their time to wide pairs these volumes will be very useful.

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1884. **Holden**, E. S. List of 111 New Double Stars . . . . encountered in the Sweeps from December 1881, to January 1884.

Contains Washburn 61 to Washburn 171, found with the 15·6-inch refractor, excepting ten high southern pairs found with Burnham's 6-inch refractor during an expedition to Caroline Island, in the South Pacific Ocean.

1884. **Küstner**, F. Messungen von Doppelsternen am Hamburger Aequatoreal. 4to. Kiel.
(*Astr. Nachr.*, Band 108, No. 2584.)

Made with two different object-glasses: 9·05-inch (Schröder) and 9·46-inch (Merz).

1884. **Russell**, H. C., and **Hargrave**, L. New Double Stars. 8vo. Sydney.
(*Proc. Roy. Soc. N.S.W.*, 1883, pp. 123–128.)

A list of 130 new double stars found by Mr Russell and Mr Hargrave in 1882–1883. The observers' names are not given, hence it is impossible to indicate with certainty to whom the new pairs are due. Very few indeed of this list fall within the limits of distance adopted for the Reference Catalogue; for those included the discoverer has been assumed to be Mr Hargrave. Mr Sellors calls this list Syd_2 in his measures.

1884. **Seabroke**, G. M. Fourth Catalogue of Micrometrical Measures of Double Stars. 4to. London.
(*Mems. R. A. S.*, vol. xlviii. pp. 195–224.)

A few of the measures were made by Mr C. H. Hodges and Mr A. Percy Smith.

1885–1887. **Engelmann**, Rudolf. Doppelsternmessungen.

1885. *Astr. Nach.*, Band 111, Nos. 2662–63.
1885. „ „ 112 „ 2677–78.
1886. „ „ 115 „ 2742.
1887. „ „ 117 „ 2786.

Of Σ and OΣ stars, made with a 7½-inch Clark Refractor.

1885. **Sadler**, Herbert. Notes and Corrections to Sir John Herschel's Synopsis of all Sir William Herschel's Measures. 8vo. London.
(*M. N. R. A. S.*, vol. xlv. pp. 316–325.)

An important list of corrections.

1885. **Tebbutt**, John. Observations of Double Stars at Windsor, N.S.W. 8vo. London.
(*M. N. R. A. S.*, vol. xlvi. pp. 50–55.)

The first of a valuable series, this set being made with a 4½-inch refractor (not driven by clockwork) between 1880–1885.

1886. **Ball**, L. de. Doppelsternbeobachtungen. 4to. Kiel.
(*Astr. Nachr.*, Band 115, No. 2753.)

All Σ or OΣ stars, measured with a 10-inch refractor. Two have south declination.

1886. **Bigourdan**, G. Sur l'Équation personelle dans les Mesures d'Étoiles Doubles. Thèse de doctorat. (pp. 1–74.) 4to. Paris.

1886. **Gould**, B. A., and **Thome**, J. M. Catálogo General Argentino. 4to. Córdoba.

Several pairs are due to this catalogue, which contains meridian observations of both components of many double stars.

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1886. **Peek**, Cuthbert E. Astronomical Observations, 1882–1885. 4to. London.

On pp. 6–11 some remarks on the double stars near η Argûs will be found. The observations were made in 1882.

1886. **Wilson**, H. C. On Personal Errors in Double-Star Observations. 8vo. Northfield, Minn.
(*Sidereal Messenger*, vol. v. Nos. 6 and 7.)

1887. **Hall**, A. The Nomenclature of Double Stars. 4to. Boston, Mass.
(*Astr. Journ.*, vol. vii. No. 159.)

Deprecating the increase of new symbols until the astronomer has found a pretty large number of new double stars. In the present catalogue this warning has been steadily borne in mind; many symbols having been discarded, and only one new one (viz. λ for Lowell) adopted.

1887. **Hough**, G. W. Catalogue of 209 New Double Stars. 8vo. Chicago.
(*Chicago Astronomical Society Report for* 1885 *and* 1886, pp. 27–36.)

Found with the 18½-inch Dearborn refractor with which Clark discovered the companion to Sirius.
Also printed in *Astr. Nachr.*, Nos. 2778–79.

1887. **Jedrzejewicz**, J. Mesures Micrométriques d'Étoiles Doubles. 4to. Kiel.
(*Astr. Nachr.*, Band 116, No. 2772.)

Third series made with a 6½-inch Steinheil refractor at Plonsk.
All Σ and OΣ stars.

1887. **Leavenworth**, F. P., and **Muller**, F. New Double Stars discovered at the Leander McCormick Observatory. 4to. Boston, Mass.
(*Astr. Journ.*, vol. vii. No. 156.)

Thirteen pairs, all but one of which are south of the Equator.

1887. **Marth**, A. On the Formulæ for Correcting Approximate Elements of the Orbits of Binary Stars. 8vo. London.
(*M. N. R. A. S.*, vol. xlvii. pp. 480–494.)

1887. **Pritchett**, C. W., H. S., and C. W., jun. Measures of Double Stars. 4to. Lynn, Mass.
(*Publications of the Morrison Observatory*, No. 1, pp. 38–49.)

Many southern pairs measured with the 12¼-inch Alvan-Clark Refractor during 1880–1884.

1887. **Russell**, H. C., and **Pollock**, J. A. Measures of Southern Double Stars, made at the Observatory, Sydney, N.S.W. 8vo. London.
(*M. N. R. A. S.*, vol. xlvii. pp. 473–477.)

Made in 1884, '6, and '7. Reprinted with other measures in 1891.

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1887. **Tisserand,** F. Sur la Force qui produit les Mouvements des Étoiles Doubles. 8vo. Paris.
(*Bulletin Astronomique*, vol. iv. pp. 5–15.)

See also tome i. chap. i. of his *Traité de Mécanique Céleste.*

1887. **Washburn Observatory.** Double Star Observations. 8vo. Madison.
(*Publications*, vol. v. pp. 101–115.)

A few southern stars.
The observations were made by Dr Davies, Miss Lamb, and Mr Updegraff.

1888. **Burnham,** S. W. New Double Stars. 4to. Boston, Mass.
(*Astr. Journ.*, vol. viii. No. 186.)

A preliminary list only.

1888. **Clerke,** Agnes M. An Historical and Descriptive List of some Double Stars suspected to vary in Light. 4to. London.
(*Nature*, vol. xxxix. No. 994, pp. 55–58.)

A valuable paper on an obscure subject.
Among the cases analysed are γ Virginis, OΣ 256, β Scorpii, U Puppis, and Y Virginis.
See also *The Observatory*, vol. xi. pp. 188–192. 8vo. London.

1888. **Johnson,** S. J. Southern Double Stars. 8vo. London.
(*M. N. R. A. S.*, vol. xlviii. p. 257.)

Measures of 5 pairs made with a $3\frac{1}{4}$-inch equatorial.

1888. **Monck,** W. H. S. The Distance of Double Stars. 8vo. Northfield, Min.
(*Sidereal Messenger*, vol. vii. pp. 290–292.)

1888. **Schiaparelli,** G. V. Osservazioni sulle Stelle Doppie, Serie Prima comprendente le Misure di 465 Sistemi eseguite col Refrattore di otto pollici di Merz negli anni 1875–1885. 4to. Milano.
(*Pubblicazioni del Reale Osservatorio di Brera in Milano*, No. xxxiii. pp. i–lxxxv and 1–147.)

A valuable series containing many stars from Burnham's catalogues.

1888. **Tarrant,** K. J. Micrometrical Measures of Double Stars. 1885–1886. 4to. Kiel.
(*Astr. Nachr.*, Band 120, No. 2866).

Made with a silver on glass reflector of $10\frac{1}{4}$ inches aperture by Calver. The first of a series of measurements of Σ, OΣ, β and other stars, including—for observations made in England only—a large number of southern pairs.

1889. **Bigourdan,** G. Mesures d'Étoiles Doubles faites à l'Équatorial de la Tour de l'Ouest de 1880 à 1884. 4to. Paris.
(*Annales de l'Observatoire de Paris. Observations.* 1883. Section H., pp. 1–81.)

343 stars, very few being south of the Equator.

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1889. **Burnham,** S. W. Double-Star Observations. 4to. Kiel.
(*Astr. Nachr.*, Band 120, No. 2875.)

Measures made in 1888 at the Lick Observatory, with the new pairs β 1026 to β 1038—these constituting his 14th catalogue—but the stars are here unnumbered; see introduction to his measures made in 1889.

1889. **Burnham,** S. W. Double Star Observations. 4to. Kiel.
(*Astr. Nachr.*, Band 123, Nos. 2929–30.)

Nearly all made with the 36-inch Lick refractor in 1888 and 1889. Burnham's 15th catalogue containing the new doubles β 1039 to β 1092 is included, as well as a numbered summary of the new pairs in his 14th catalogue. Also a full account of θ Orionis as seen with the 36-inch.

1889. **Glasenapp,** S. de. On a Graphical Method for determining the Orbit of a Binary Star. 8vo. London.
(*M. N. R. A. S.*, vol. xlix. pp. 276–280.)

See also a paper by Prof. M. Kowalski in the *Proceedings of the Kasan Imperial University* for 1873.

1889. **Glasenapp,** S. de. Orbites des Étoiles Doubles du Catalogue de Poulkova. 51 pp. 8vo. St. Pétersbourg.

1889. **Haverford College Observatory.** Micrometrical Measurements of Double Stars. 8vo. . . . . .
(*Haverford College Studies*, No. 1, pp. 21–71.)

Made under the direction of Mr F. P. Leavenworth by ten observers in 1887–1889, with a 10-inch refractor by Alvan Clark & Sons.

1889. **Leavenworth,** F. P., and **Muller,** Frank. Double Stars, 1885–'86. 8vo. Charlottesville.
(*Publications of the Leander McCormick Observatory*, vol. 1, pt. 4, pp. 47–97.)

Observations of southern pairs made with the 26-inch refractor of the observatory.

1889 **Palisa,** J. Ueber die Bestimmung der Parallaxe von Doppelsternen. 4to. Kiel.
(*Astr. Nachr.*, Band 123, No. 2941.)

1889. **Tarrant,** K. J. Micrometrical Measures of Double Stars, 1887. 4to. Kiel.
(*Astr. Nachr.*, Band 121, Nos. 2898–99.)

A continuation of the observations published in *Astr. Nachr.*, No. 2866.

1889. **Tebbutt,** John. Results of Double-Star Measures at Windsor, N.S.W., during the years 1886, 1887, and 1888. 8vo. London.
(*M. N. R. A. S.*, vol. l. pp. 23–31.)

Made with refractors of $4\frac{1}{2}$ and 8-inches aperture.

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1890. **Burnham**, S. W. Double Star Observations. 4to. Kiel.
(*Astr. Nachr.*, Band 124, Nos. 2956–57.)

Nearly all made in May–July 1890, chiefly with the 36-inch Lick telescope.
Includes his 16th catalogue containing β 1093 to β 1154.

1890. **Comstock**, G. C. Observations of Double Stars. 4to. Madison, Wis.
(*Publications of the Washburn Observatory*, vol. vi. part 2, pp. 25–140.)

Mostly southern pairs measured with the 15½-inch refractor.

1890. **D'Engelhardt**, B. Observations Astronomiques faites . . . dans son Observatoire à Dresde. Part II. 4to. Dresde.

Mesures micrométriques d'étoiles de Bradley, pp. 36–80.
Liste des étoiles de Bradley qui n'ont pas de compagnons, pp. 81–102.
Mesures d'étoiles doubles écartées de Struve, pp. 103–110.

1890. **Doberck**, W. Markree Observations of Double Stars. 4to. Dublin.
(*Transactions, Royal Irish Academy*, vol. xxix. pp. 379–426.)

Made with the 13·2-inch refractor, mostly northern stars.

1890. **Hough**, G. W. Catalogue of 94 New Double Stars discovered with the 18½-inch Refractor of the Dearborn Observatory, Evanston, Ill., U.S.A., and Measures of 107 Double Stars. 4to. Kiel.
(*Astr. Nachr.*, Band 125, Nos. 2977–78.)

A continuation of the series in *Astr. Nachr.*, Nos. 2778–79.
Contains the new pairs Hough 210 to Hough 303, a goodly proportion of which are south of the equator, followed by measures of miscellaneous close pairs.

1890. **Hough**, G. W. New Double Stars. 4to. Boston, Mass.
(*Astr. Journal*, vol. ix. No. 215.)

Discovered with the 18½-inch refractor of the Dearborn Observatory in 1889–1890. Several southern pairs. Contains additional stars to those in the above paper.

1890. **Pickering**, Edward C. A New Class of Binary Stars. 8vo. London.
(*M. N. R. A. S.*, vol. l. pp. 296–298.)

Spectroscopic Binaries.

1890. **Pierson**, Wm. M. Does the Colour of a Star indicate its Age? 8vo. San Francisco.
(*Publications of the Astr. Soc. of the Pacific*, vol. ii. pp. 105–114.)

With a table of colours of binary stars. Followed on page 303 by a note by Prof. Holden.

1890. **Rambaut**, Arthur A. On the Parallax of Double Stars. 8vo. London.
(*M. N. R. A. S.*, vol. l. pp. 302–310.)

To be found by spectroscopic observations.

1890. **Schwarzschild**, K. Methode zur Bahnbestimmung der Doppelsterne. 4to. Kiel.
(*Astr. Nachr.*, Band 124, No. 2965.)

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1890. **Tarrant,** K. J. Micrometrical Measures of Double Stars, 1888. 4to. Kiel.
(*Astr. Nachr.*, Band 125, No. 2991.)

A continuation of the series in *Astr. Nachr.*, Nos. 2898–99.

1890. **Wellmann,** V. Zur Theorie des Doppelbild-Mikrometers. 4to. Kiel.
(*Astr. Nachr.*, Band 126, No. 3006.)

1890–1. **Doberck,** W. Markree Double-Star Observations. 4to. Kiel.
(*Astr. Nachr.*, Band 125, No. 2989, and Band 126, No. 3023.)

A continuation of the series in *Astr. Nachr.*, No. 2242.
The period covered by this series extends from 1879 to 1885, the measures after 1884 being made with the Lee Equatorial at Hong Kong.
The R.A.'s and Dec.'s are not given.

1891. **Burnham,** S. W. Invisible Double Stars. 8vo. London.
(*M. N. R. A. S.*, vol. li. pp. 388–395.)

Inferred from the anomalous motions of known double stars.

1891. **Burnham,** S. W. Double Star Observations. 4to. Kiel.
(*Astr. Nachr.*, Band 127, Nos. 3047–48.)

Made in 1890, mostly with the 36-inch Lick refractor.
Includes his 17th catalogue of new double stars β 1155–β 1224.

1891. **Comstock,** George C. Mr Burnham on Double Stars. 8vo. Northfield, Minn.
(*Sidereal Messenger*, vol. x. pp. 277–279.)

Quoting a letter from Mr Burnham describing his method of observing.
Besides the articles referred to, many minor notes on double stars will be found in this new series of the *Sidereal Messenger*.

1891. **Glasenapp,** S. Measures of Double Stars discovered at Cordoba. 4to. Boston, Mass.
(*Astr. Jour.*, vol. xi. No. 241.)

Followed in No. 243 by a paper by Prof. Burnham, entitled "Notes on the Double Stars of the *Uranometria Argentina*."

1891. **Gore,** J. E. A Catalogue of Binary Stars for which Orbits have been computed. With notes. 8vo. Dublin.
(*Proceedings, Royal Irish Academy*, 3rd series, vol. i. No. 4, pp. 571–99.)

1891. **Haverford College Observatory.** Double Star Observations. 8vo.
(*Studies*, No. 11, pp. 28–40.)

Made between 1889–1892 with the 10-inch refractor—the greater part by Mr W. H. Collins—the remainder were made by Mr Leavenworth and students of practical astronomy. A fair proportion of southern stars.

1891. **Hayn,** F. Doppelsternmessungen. 4to. Kiel.
(*Astr. Nachr.*, Band 128, No. 3051.)

Only two or three well-measured southern pairs are included.

1891. **Pickering,** E. C. The Discovery of Double Stars by means of their Spectra. 4to. Kiel.
(*Astr. Nachr.*, Band 127, No. 3034.)

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1891. **Rambaut,** Arthur A. On a Geometrical Method of finding the most probable Apparent Orbit of a Double Star. 8vo. Dublin.

(*Scientific Proceedings, Royal Dublin Society*, pp. 95–98.)

1891. **Rambaut,** Arthur A. On the Determination of Double Star Orbits from Spectroscopic Observations of the Velocity in the Line of Sight. 8vo. London.

(*M. N. R. A. S.*, vol. li. pp. 316–330.)

1891. **Russell,** H. C., **Hargrave,** L., and **Pollock,** J. A. Results of Double Star Measures. 8vo. Sydney.

Measures of double stars made at the Sydney Observatory with the 7½- and 11½-inch refractors between 1882 and 1890 (with a few exceptions), preceded by a catalogue of double stars which seem to be in motion. A very valuable list.

Also printed in the *Mems. R. A. S.*, vol. l. pp. 57–74. 4to. London, 1892.

1891. **Tebbutt,** John. Double Star Measures at Windsor, N.S.W., 1889 and 1890. 8vo. London.

(*M. N. R. A. S.*, vol. li. pp. 331–333.)

Made with an 8-inch Grubb refractor.

Eight southern pairs.

1892. **Burnham,** S. W. Double Star Discoveries and Measures. 4to. Kiel.

(*Astr. Nachr.*, Band 130, Nos. 3113–14.)

Contains his 18th catalogue of the new double stars β 1225–β 1266.

In the preface to this series, Burnham mentions that the number of measures made per night "means continuous observing, without interruption, for eight or ten hours."

1892. **Glasenapp,** S. de. Mesures d'Étoiles Doubles faites à Hoursouf. 8vo. St. Pétersbourg.

Made with a 6·4-inch Repsold refractor in 1890.

Nearly all are southern stars.

1892. **Grossmann,** Ernst. Untersuchung über systematische Fehler bei Doppelsternbeobachtungen ausgeführt in Verbindung mit einer Bahnbestimmung des Doppelsterns "η coronae borealis." Inaugural-Dissertation. 4to. Göttingen.

1892. **Hall,** Asaph. Observations of Double Stars, Part II. 4to. Washington.

(*Washington Observations*, 1888, Appendix I. pp. E.1–E.203.)

A continuation of his measures with the 26-inch equatorial. The observations cover the period 1880–1891.

There is a considerable number of southern pairs in this fine series.

1892. **Haverford College Observatory.** Double Star Observations. 8vo.

(*Proceedings of the Observatory*, pp. 11–41.)

Made in 1891–92 with the 10-inch refractor.

The observations are divided into two parts—the first part being chiefly due to F. P. Leavenworth and W. H. Collins, the second part to Geo. L. Jones.

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1892. **Leavenworth,** F. P., and others. Measures of Double Stars. 4to. Boston, Mass.
(*Astr. Journ.*, vol. xii. No. 278.)

Made at the Haverford College Observatory with the 10-inch refractor in 1892, by F. P. Leavenworth, W. H. Collins, J. H. Dennis, E. H. Gifford, and G. L. Jones. Many southern stars.

1892. **Leavenworth,** F. P. Parallax of Ö.A. 14,320. 8vo.
(*Proceedings of Haverford College Observatory*, pp. 1–5.)

This star and a neighbouring star 5′ S. of it have a common proper motion of 3″·75. Its position for 1900 is

R.A. $15^h\ 4^m\ 45^s$. S.D. 15° 54′·1.

The parallax found is negative.

1892. **Maw,** W. H. Double-Star Observations, 1888–91. 4to. London.
(*Mems. R. A. S.*, vol. l. pp. 75–112.)

Observations of 153 pairs made with a 6-inch Cooke refractor.

Some southern pairs are included. The observations seem to be very good. On an average, each pair has been measured on three nights.

1892. **Seabroke, Smith,** and **Highton.** Fifth Catalogue of Micrometrical Measures of Double Stars, made at the Temple Observatory, Rugby. 4to. London.
(*Mems. R. A. S.*, vol. l. pp. 1–28.)

1892. **Tebbutt,** John. Results of Double-Star Measures with the 8-inch Equatorial at Windsor, N.S.W., in 1891. 8vo. London.
(*M. N. R. A. S.*, vol. lii. pp. 386–388.)

Eight southern pairs.

1893. **Burnham,** S. W. Double Star Observations made at the Lick Observatory in 1892. 4to. Kiel.
(*Astr. Nachr.*, Band 131, Nos. 3141–42.)

Contains his 19th catalogue of new double stars, viz., β 1267 to β 1274.

1893. **Lewis;** T. Double Star Astronomy. 8vo. London.
(*The Observatory*, vol. xvi. Nos. 204–5–6–7.)

A very valuable *précis* of the subject.

1893. **Searle,** Geo. M. Observations of Double Stars. 4to. Boston, Mass.
(*Astr. Journ.*, vol. xiii. No. 299.)

A few measures made with a Clausen double image micrometer.

1893. **See,** T. J. J. Die Entwickelung der Doppelstern-Systeme. 4to. Berlin.

Prof. See's well-known Inaugural Dissertation.

1893. **Seeliger,** H. Ueber Herrn Burnham's "Invisible Double Stars" und insbesondere über ϵ Hydrae. 4to. Kiel.
(*Astr. Nachr.*, Band 132, No. 3165.)

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1893. **Sellors,** R. P. Observations of Double Stars made at Sydney Observatory (communicated by H. C. Russell, B.A., F.R.S., Government Astronomer). 8vo. London.
(*M. N. R. A. S.*, vol. liv. pp. 123–4.)

A list of 14 new pairs, all under 2″=Sellors 1 to 14.

1893. **Sellors,** R. P. Measures of Double Stars. 4to. Kiel.
(*Astr. Nachr.*, Band 132, No. 3154.)

Made with the 11½-inch Schröder refractor of the Sydney Observatory between April 1890 and December 1891. Several new pairs found by Mr Sellors are included in this list.

1893. **Tarrant,** Kenneth J. Micrometrical Measures of Double Stars made in the years 1889, 1890, 1891, and 1892. 4to. Kiel.
(*Astr. Nachr.*, Band 133, No. 3185–86.)

Continued from *Astr. Nachr.*, No. 2991.
No R.A.'s or Dec.'s are given.

1893. **Wilsing,** J. Ueber die Bestimmung von Bahnelementen enger Doppelsterne aus spectroskopischen Messungen der Geschwindigkeits-Componenten. 4to. Kiel.
(*Astr. Nachr.*, Band 134, No. 3198.)

1894. **Burnham,** S. W. Proper Motions of Double Stars. 8vo. Northfield, Minn.
(*Astronomy and Astro-Physics*, vol. xiii. No. 121.)

Determinations of proper motion from micrometric measures of a number of optical double stars.

1894. **Burnham,** S. W. How to find the Orbit of a Double Star by a Graphical Method. 8vo. Northfield, Minn.
(*Popular Astronomy*, vol. i. pp. 243–248 and 349–358.)

It may be said that the only difficulty in this method is that inherent in all methods, *i.e.*, drawing the apparent ellipse. In this connection, reference may be made to the section on the "Orbit of a Binary Star" in Ball's *Atlas of Astronomy*, London, 1892.

1894. **Burnham,** S. W. Double Star Observations made with the 36-inch and 12-inch Refractors of the Lick Observatory, from August, 1888, to June, 1892. 4to. Sacramento.
(*Publications of the Lick Observatory*, vol. ii. pp. 2–254.)

These observations for the greater part had previously appeared in various journals; they are here collected in a convenient form. Probably the most notable contribution to Double Star Astronomy in recent years.

1894. **Cohn,** Fritz. Messungen von Doppelsternen am Heliometer zu Königsberg. 4to. Kiel.
(*Astr. Nachr.*, Band 135, No. 3240.)

Of easy stars—they do not seem to be superior to filar micrometer measures.

1894. **Collins,** Wm. H., and **Jones,** George L. Double Star Measures. 4to. Boston, Mass.
(*Astr. Journ.*, vol. xiii. No. 312.)

Made, chiefly by the latter observer, in 1893, with the 10-inch equatorial of the Haverford College Observatory. Mostly northern stars.

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1894. **Glasenapp,** S. de. Observations Astronomiques faites à Abastouman. 8vo. St. Pétersbourg.
(*Deuxième série des mesures d'étoiles doubles.*)

Made with a 9½-inch Reinfelder and Hertel refractor in 1892–1893, in continuation of his measures of 1890, but fewer southern stars are included in this series.

1894. **Hagen,** J. G. Messungen von Doppelsternen mittelst Photographie. 4to. Kiel.
(*Astr. Nachr.*, Band 136, No. 3258.)

There is a comparison between the results obtained by photography and Dr Cohn's Heliometer measures in *Astr. Nachr.*, No. 3240.

1894. **Hall, A.** The Orbits of Double Stars. 4to. Boston, Mass.
(*Astr. Journ.*, vol. xiv. No. 324.)

On the computation of orbits with a numerical example.

1894. **Hough,** G. W. New Double Stars, discovered in 1893, and measures . . . . at the Dearborn Observatory. 8vo. London.
(*M. N. R. A. S.*, vol. liv. p. 251.)

Eight southern pairs in addition to others; quoted in the Annual Report of the Council of the R. A. S.

1894. **Hough,** G. W. Catalogue of 187 New Double Stars discovered with the 18½-inch Refractor of the Dearborn Observatory of Northwestern University, and Measures of 152 Double Stars. 4to. Kiel.
(*Astr. Nachr.*, Band 135, Nos. 3233–34.)

Contains Hough 304 to Hough 490, found in 1889 to 1893, and measures of miscellaneous stars, a good many of which are south of the equator.

1894. **Howard,** Charles P. A Graphical Method for Determining the Apparent Orbits of Binary Stars. 8vo. Northfield, Minn.
(*Astronomy and Astro-Physics*, vol. xiii. No. 126.)

A detailed explanation of his method, an outline of which appeared in the *Astronomical Journal* in 1891.

1894. **Lehmann-Filhés,** R. Ueber die Bestimmung einer Doppelsternbahn aus spectroskopischen Messungen der im Visionsradius liegenden Geschwindigkeitscomponente. 4to. Kiel.
(*Astr. Nachr.*, Band 136, No. 3242.)

1894. **Lewis, Turner,** and **Edney.** Results of Micrometer Measures of Double Stars with the 12¾-inch Merz Refractor, at the Royal Observatory, Greenwich, during the year 1893. (Communicated by the Astronomer Royal.) 8vo. London.
(*M. N. R. A. S.*, vol. liv. pp. 314–317.)

A few pairs south of the equator are included.

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1894. **Scott**, J. L. Double Star Measures. 8vo. London.
(*Journal of the British Astronomical Association*, vol. v. pp. 75–77.

Made at Shanghai in 1892–1893.
All but one or two are southern stars.

1894. **Sellors**, R. P. Recent Measures of Double Stars made at Sydney. 4to. Kiel.
(*Astr. Nachr.*, Band 135, No. 3240.)

A continuation of the work given in *Astr. Nachr.*, No. 3154. The observations were made between Dec. 1891 and Dec. 1893 with the 11½-inch refractor.

1895. **Aitken**, R. G. Double-Star Measures. 8vo. San Francisco.
(*Publications of the Astr. Soc. of the Pacific*, vol. vii. pp 305–310.)

Made in 1895 with the 12-inch refractor of the Lick Observatory.

1895. **Bigourdan**, G. Mesures Micrométriques d'Étoiles Doubles, faites à l'Observatoire de Paris, du 11 Juillet 1890 au 31 Décembre 1894. 8vo. Paris.
(*Bulletin Astronomique*, t. 12, pp. 298–312.)

Made with the Martin refractor of 12-inches.
Stars from various catalogues.

1895. **Boyd**, J. Harrington. The Determination of the Apparent Position of the Orbit of the Companion of a Binary Star. 8vo. Northfield, Minn.
(*Popular Astronomy*, vol. iii. pp. 19–21.)

1895. **Callandreau**, O. Mesures Micrométriques d'Étoiles Doubles, faites à l'Observatoire de Paris, en 1894. 8vo. Paris.
(*Bulletin Astronomique*, t. 12, pp. 522–3.)

A few Σ stars.

1895. **Doberck**, W. Approximate Values of v, M and $\frac{r}{a}$ for different values of e. 4to. Kiel.
(*Astr. Nachr.*, Band 139, No. 3316.)

These tables are of great use in computing double star ephemerides, etc.
See also: 1878, Doberck.

1895. **Doberck**, W. On the Axes and Periods of Double Stars. 4to. Kiel.
(*Astr. Nachr.*, Band 138, No. 3293.)

A very short but interesting paper: "close binaries are farther from us than wide (binaries), or the mass is smaller in close pairs."

1895. **Ebell**, Martin. Beobachtungen von Doppelsternen. 4to. Kiel.
(*Astr. Nachr.*, Band 139, No. 3321.)

Made at the Royal Observatory, Berlin, with the 9·6-inch refractor in 1893–1895, mostly of Σ stars.

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1895. **Glasenapp,** S. de. Mesures Micrométriques d'Étoiles Doubles faites à St. Pétersbourg et à Domkino. 8vo. St. Pétersbourg.
(*Troisième série des mesures d'étoiles doubles.*)

Made with refractors from 4-inches to 9½-inches aperture in 1893 and 1894. Very few southern pairs.

1895. **Innes,** R. T. A. A List of Probably New Double Stars. 8vo. London.
(*M. N. R. A. S.*, vol. lv. pp. 312–315.)

Contains 26 stars found to be double with a 6¼-inch refractor.
There is a list of errata on p. 544.

1895. **Knorre,** V. Beobachtungen von Doppelsternen. 4to. Kiel.
(*Astr. Nachr.*, Band 138, No. 3300.)

The southern stars measured are 11 Monocerotis and ζ Aquarii.

1895. **Seabroke,** G. M., and **Highton,** H. P. Further Measures of Double Stars made at the Temple Observatory, Rugby, during the Years 1890–1895. 4to. London.
(*Mems. R. A. S.*, vol. li. pp. 267–276.)

1895. **See,** T. J. J. Micrometrical Measures of Double Stars, made with the 26-inch Refractor of the Leander McCormick Observatory. 4to. Boston, Mass.
(*Astr. Journ.*, vol. xv. No. 349.)

Includes 5 southern binaries.
Followed in No. 359 by a further list of measures made at the Washburn Observatory by the same observer.

1895. **See,** T. J. J. Theory of the Determination, by means of a single spectroscopic observation, of the absolute dimensions, etc. (of Binary Systems). 4to. Kiel.
(*Astr. Nachr.*, Bd. 139, No. 3314.)

Followed, in No. 3332 of the same journal, by some remarks by Prof. R. Lehmann-Filhés.

1895. **Sellors,** R. P. Recent Measures of Double Stars made at Sydney. 4to. Kiel.
(*Astr. Nachr.*, Band 138, No. 3303.)

A continuation of the observations published in the *Astr. Nachr.*, No. 3240.
Made in 1894 with the 11½-inch refractor.

1895. **Tebbutt,** John. Results of Double-star Measures with the 8-inch Equatorial at Windsor, N.S.W., in 1894. 8vo. London.
(*M. N. R. A. S.*, vol. lv. pp. 308–311.)

A continuation of previous series.

1896. **Burnham,** S. W. The Binary Systems. 8vo. Northfield, Minn.
(*Popular Astronomy*, vol. iv. pp. 169–177.)

On the probable number of physical or binary systems now known. Burnham insists on the futility of retaining wide faint pairs in double star catalogues. Upwards of 10,000 pairs have been registered, and it may be safely said that 7000 of these will never repay micrometrical observation.

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1896. **Collins**, W. H. Double-Star Observations. 4to. Boston, Mass.
(*Astr. Journ.*, vol. xvi. No. 378.)

Made at Haverford College Observatory in 1894–1896 with the 10-inch refractor. Mostly northern pairs.

1896. **Comstock**, G. C. Observations of Double Stars. 4to. Madison, Wis.
(*Publications of the Washburn Observatory*, vol. x. pt. i. pp. 1–77.)

Very few southern stars are included in these observations made during 1892–1896.

1896. **Doberck**, W. A Formula to Correct Double-Star Observations for Refraction. 8vo. London.
(*The Observatory*, vol. xix. pp. 268–270.)

1896. **Doberck**, W. On the Orbit of η Coronae Borealis. 4to. Kiel.
(*Astr. Nachr.*, Bd. 141, No. 3370.)

Followed by some tables giving the probable errors of double star observers.

1896. **Doberck**, W. Double Star Observations. 4to. Kiel.
(*Astr. Nachr.*, Bd. 141, No. 3378.)

Continued from *Astr. Nachr.*, No. 3023.
Many southern pairs, observed at Hong Kong.
Distances are not always given.

1896. **Everett**, Alice. Galactic Longitude and Latitude of Poles of Binary-Star Orbits. 8vo. London.
(*M. N. R. A. S.*, vol. lvi. pp. 462–466.)

An interesting paper with a table, but the author remarks that the data on which it is founded are not satisfactory.

1896. **Innes**, R. T. A. New Double Stars. 8vo. London.
(*Journ. Brit. Astr. Assocn.*, vol. vi. pp. 261–262.)

Found with a silver on glass reflector made by an amateur.
Includes Nos. 27 to 42.

1896. **Leavenworth**, F. P. Double-Star Observations. 4to. Boston, Mass.
(*Astr. Journ.*, vol. xvi. No. 382.)

Made with the 16-inch refractor of the Goodsell Observatory in 1893.

1896. **Lewis**, T., and others. Results of Micrometer Measures of Double Stars made with the 28-inch Refractor at the Royal Observatory, Greenwich, in the years 1894 and 1895. 8vo. London.
(*M. N. R. A. S.*, vol. lvi. pp. 358–367.)

The only southern stars in this list are 42 Ceti, Σ 2173, β 631, and 4 Aquarii, which were observed by Mr Lewis.

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1896. **Schwarzschild,** Karl. Ueber Messung von Doppelsternen durch Interferenzen. 4to. Kiel.
(*Astr. Nachr.*, Bd. 139, No. 3335.)

Followed by measures of some well-known pairs.

1896. **See,** T. J. J. Researches on the Evolution of the Stellar Systems, vol. i. 4to. Lynn, Mass., U.S.A.

This important work contains three chapters: I. On the Development of Double Star-Astronomy, and on the Mathematical Theories of the Motions of Binary Stars; II. On the Orbits of Forty Binary Stars; III. Results of Researches on the Orbits of Forty Binary Stars, with General Considerations Respecting the Stellar Systems. There are many plates. The mass of information gathered together in this volume renders it very valuable. Professor See's previous investigations on double stars are therein collected.

1896. **Sellors,** R. P. Measures of Double-stars made at Sydney. 4to. Kiel.
(*Astr. Nachr.*, Bd. 141, No. 3369.)

Continued from *Astr. Nachr.*, No. 3303. Made in 1895 with the 11½-inch refractor.
Includes the new pairs Sellors 15–21.

1896. **Tebbutt,** John. Results of Double-star Measures with the 8-inch Equatorial at Windsor, N.S.W., in 1895. 8vo. London.
(*M. N. R. A. S.*, vol. lvi. pp. 353–357.)

A continuation of previous measures.

1896. **Zwiers,** H. J. Ueber eine neue Methode zur Bestimmung von Doppelsternbahnen. 4to. Kiel.
(*Astr. Nachr.*, Bd. 139, No. 3336.)

An application of the method to the orbit of Sirius is made.

1897. **Aitken,** R. G. Double Star Measures made at the Lick Observatory. 4to. Kiel.
(*Astr. Nachr.*, Bd. 142, Nos. 3395–96.)

A fine series, about half being southern pairs.

1897. **Aitken,** R. G. Double Star Measures made at the Lick Observatory. 4to. Kiel.
(*Astr. Nachr.*, Bd. 145, Nos. 3465–3466.)

Measures made with the 12 and 36-inch telescopes in continuation of those given in the *Astr. Nachr.*, Nos. 3395–3396. The stars measured are of three classes.

1. Stars discovered at the Lick Observatory.
2. A list of close stars sent by Mr Burnham.
3. Miscellaneous stars, including a number of neglected wide pairs.

The measures are followed by a comparison with Professor See's ephemerides of 15 pairs.
See also *Pub. Ast. Soc. of the Pacific*, vol. viii. No. 53.

1897. **Cape Royal Observatory.** New Double Stars found at the Cape Observatory in 1896. 8vo. London.
(*M. N. R. A. S.*, vol. lvii. pp. 533–541.)

A revised list of stars taken from the lists in *Astr. Nachr.*, Nos. 3406 and 3419.

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1897. **Chofardet** and **Petit.** Mesures d'Étoiles Doubles. 4to. Kiel. 8vo. Paris.
(*Astr. Nachr.*, Bd. 144, No. 3450, and *Bulletin Astronomique*, 1897, p. 404.)

Made at the Besançon Observatory. All are Σ stars.

1897. **Doberck,** W. Double Star Observations. 4to. Kiel.
(*Astr. Nachr.*, Bd. 145, No. 3466.)

Measures made at Columbus, Ohio, with a 12-inch refractor. Only three pairs have south declination.

1897. **Doolittle,** Eric. The Effect of Refraction on the Measures of Double Stars. 8vo. Northfield, Minn.
(*Popular Astronomy*, vol. v. pp. 143–151.)

With tables for latitude 40°.

1897. **Gale,** W. F. New Double Stars and Ring Nebula. 4to. Kiel.
(*Astr. Nachr.*, Bd. 143, No. 3426.)

Five double stars found in 1894 with an 8½-inch reflecting telescope by With.

1897. **Glasenapp,** S. de. Mesures Micrométriques d'Étoiles Doubles. Série iv. 8vo. St. Pétersbourg.

1897. **Innes,** R. T. A. Lists of New Double Stars discovered at the Royal Observatory, Cape of Good Hope. 4to. Kiel.

First List,	*Astr. Nachr.*,	No.	3406.	Bd. 142–145.
Second List	„	„	3419.	
Third List	„	„	3438.	
Fourth List	„	„	3462.	

Found in 1896 and 1897 with the 6·9-inch Merz refractor.
Including several pairs found incidentally by Messrs Cox and Power at the Transit Circle.
See also *M. N. R. A. S.*, vol. lvii. pp. 533–541, where numbers are assigned to the stars.
In *Astr. Nachr.*, No. 3467, there are corrections to previous lists.

1897. **Lagarde,** I. Sur les Méthodes Graphiques propres à Déterminer les Éléments des Orbites des Étoiles Doubles. 8vo. Paris.
(*Bulletin Astronomique*, t. xiv. pp. 129–132.)

1897. **Lehman,** D. A. Double-Star Measures. 8vo. San Francisco.
(*Publications of the Astr. Society of the Pacific*, vol. ix. pp. 141–144.)

Made in 1897 with the 12-inch refractor of the Lick Observatory. Thirteen stars, of which 5 are south of the equator.

1897. **Pickering,** W. H., and **Bailey,** Solon I. Southern Double Stars. 8vo. Cambridge, Mass.

A list of the Argentine General Catalogue numbers of 151 stars south of Dec.–30° of the sixth magnitude or brighter with companions estimated to be within 30″ distance, stars already announced as double by *h* or Russell not being included.

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Found in 1891 with a 13-inch refractor at Arequipa. All were discovered by Prof. Bailey, except those between 12h and 18h of R.A., which are due to Prof. W. H. Pickering. When two or more companions were noted the letter T is inserted after the number.

Published by Prof. E. C. Pickering in *Harvard College Observatory Circular*, No. 18, 1897, July 29, and reprinted in *Astr. Nachr.*, Bd. 144, No. 3447, and elsewhere.

The absence of all detail of any value in the above publication is the subject of a paper by the present writer in the *Astr. Journal*, No. 417, Nov. 1897. Many of the stars are very wide —at least as far as can be ascertained with the 6·9-inch telescope of the Cape Observatory— but it seemed better to give them in their places in the Reference Catalogue, excepting several wide pairs which have been placed in the list of rejected stars. Many of the close pairs have been found by other observers, including *h* and Russell, and were known to astronomers before the appearance of the circular.

1897. **Scott,** J. L. Measures of Double Stars. 8vo. London.
(*Journ. Brit. Astr. Assocn.*, vol. viii. pp. 66–69.)

Made in 1896–1897 at Shanghai with a 5-inch refractor.

A continuation of his measures published in 1894.

1897. **See,** T. J. J. Discovery of Three Close Southern Binaries. 4to. Kiel.
(*Astr. Nachr.*, Bd. 143, No. 3412.)

New Double Stars in the Southern Hemisphere, discovered at the Lowell Observatory. 4to. Kiel.
(*Astr. Nachr.*, Bd. 143, No. 3432.)

Found with the Lowell 24-inch Clark refractor in Mexico. The above lists are merely preliminary announcements of the important work undertaken by Prof. See.

Similar notices appeared contemporaneously in several other astronomical journals.

1897. **Sellors,** R. P. Measures of Double Stars made at Sydney, 1896. 4to. Kiel.
(*Astr. Nachr.*, Bd. 143, No. 3423.)

A continuation of the work published in the *Astr. Nachr.*, No. 3369.

Made with the 11½-inch Schröder refractor.

Three new pairs are included.

Followed by a short paper, "New Double Stars," found on the 19th January 1897, but these two stars had been found in 1896 at the Cape.

1897. **Tebbutt,** John. Results of Double-Star Measures with the 8-inch Equatorial at Windsor, N.S.W., in 1896. 8vo. London.
(*M. N. R. A. S.*, vol. lvii. pp. 584–5.)

Measures of eight southern pairs.

1898. **Aitken,** R. G. Double-Star Measures. 4to. Boston, Mass.
(*Astr. Journ.*, vol. xviii., No. 429.)

Made with the 12 and 36-inch refractors of the Lick Observatory.

Several are southern pairs, which urgently required remeasurement.

1898. **Barnard,** E. E. Micrometrical Measures of Double Stars, etc. 4to. Boston, Mass.
(*Astr. Journ.*, vol. xix., No. 447.)

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1898. **Belopolsky**, A. Ueber einen Versuch die Geschwindigkeiten im Visionsradius der Componenten von γ Virginis und γ Leonis zu bestimmen. 4to. Kiel.

(*Astr. Nachr.*, Bd. 147, No. 3510.)

An important application of the Fox Talbot method proposed in 1871.

1898. **Doberck**, W. On Double Star Orbits: their Periods and Eccentricities. 4to. Kiel.

(*Astr. Nachr.*, Bd. 147, No. 3519.)

1898. **Doolittle** [Eric]. The Double Star Work of the Flower Observatory. 8vo. Chicago.

(*Astrophysical Journal*, vol. viii. pp. 247–9.)

1898. **Knorre**, V. Beobachtungen von Planeten und Doppelsternen. 4to. Kiel.

(*Astr. Nachr.*, Bd. 147, No. 3518.)

1898. **Innes**, R. T. A. Fifth List of New Double Stars discovered at the Royal Observatory, Cape of Good Hope. 4to. Kiel.

(*Astr. Nachr.*, Bd. 146, No. 3501.)

Contains Nos. 260–305, found with the 6·9-inch Merz refractor. Stars numbered over 305 in the Reference Catalogue have been found since the date of this list and are otherwise unpublished.

1898. **Monck**, W. H. S. The Brilliancy of Binary Stars. 8vo. London.

(*Journ. Brit. Astr. Assocn.*, vol. viii. pp. 132–134.)

1898. **Morgan**, Herbert R. Observations of Double-Stars, made with the 26-inch Refractor of the Leander McCormick Observatory. 4to. Boston, Mass.

(*Astr. Journ.*, vol. xix. No. 439.)

1898. **Russell**, Henry Norris. A New Graphical Method of Determining the Elements of a Double-Star Orbit. 4to. Boston, Mass.

(*Astr. Journ.*, vol. xix. No. 434.)

1898. **See**, T. J. J. Discoveries and Measures of Double and Multiple Stars in the Southern Hemisphere made with the 61-cm. Refractor of the Lowell Observatory. 4to. Boston, Mass.

(*Astr. Journ.*, vol. xviii. Nos. 431–2.)

Found with a 24-inch equatorial between August 1896 and December 1897, mostly by Prof. See, but a few by Mr W. A. Cogshall. This is the most important list of discoveries of southern double stars in recent years, and it is preceded by an interesting introduction containing Prof. See's views on various questions in Double Star Astronomy.

The pairs in this list are numbered $\lambda_1 1$ to $\lambda_1 500$, it being Prof. See's intention to number his second catalogue $\lambda_2 1$, etc., and finally to rearrange all his stars, using λ alone. This will certainly lead to much confusion, unless the R.A. and Dec. of each pair are always quoted. It was probably the fear of confusion which deterred H, Σ, *h*, β and other astronomers from adopting a similar course. The prefix λ has alone been used in the foregoing catalogue.

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It may be noticed that in many cases Prof. See's identifications have not been adopted. Should the alterations made be confirmed it must be remembered that the destruction of many of Prof. See's papers by a fire at Flagstaff in 1897 must have proved a great inconvenience.

1898. **See**, T. J. J. Micrometrical Measures of Double and Multiple Stars in the Southern Hemisphere made with the 61-cm. Refractor of the Lowell Observatory. 4to. Kiel.
(*Astr. Nachr.*, Band 146, Nos. 3495–6.)

Measured whilst engaged on the work of the preceding entry. An important contribution, from the fact that many of the pairs are here measured for the first time.

In addition to the measures extracted from Prof. See's lists many unpublished ones will also be found in the foregoing catalogue. I am greatly indebted to Prof. See for his kindness in communicating all his measures, practically as they were made, in MS., with permission to make use of them forthwith.

Messrs Cogshall and Boothroyd were associated with Prof. See in this work.

1898. **Solá**, José Comas. Beobachtungen von Doppelsternen. 4to. Kiel.
(*Astr. Nachr.*, Band 146, No. 3497.)

Made with an $8\frac{3}{4}$-inch refractor at San Feliu de Guixols, in Catalonia, in 1897 by Messrs Comas Solá and Patxot—mostly northern Σ stars.

1899. **Hough**, G. W. Catalogue of 132 New Double Stars discovered with the $18\frac{1}{2}$-inch Refractor of the Dearborn Observatory . . . . and Measures of 255 Double Stars. 4to. Kiel.
(*Astr. Nachr.*, Bd. 149, Nos. 3557–58.)

Contains Hough 491—Hough 622. Former Catalogues have been published in the *Astr. Nachr.*, Nos. 2778–9, 2977–8, and 3233–4. Professor Hough has rejected some of the close pairs of his earlier Catalogues which have been found to be single or doubtful, but as he does not state their names or positions, it has not been possible to point out any which are included in the Reference Catalogue.

1899. **Solá**, J. Comas. Mesures d'étoiles multiples. 2e et 3e Sér. 4to. Kiel.
(*Astr. Nachr.*, Bd. 148, No. 3529, and Bd. 149, No. 3563.)

Continued from *Astr. Nachr.*, No. 3497.

Include about 30 southern pairs.

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ADDENDA:—I.

List of Double Stars accidentally omitted from the Reference Catalogue, or found while it was passing through the press.

(23*rd Aug.* 1899.)

Nos. 2*a*, 7*a*, 8*a*, 9*a*, 12*a*, 23*a*, 36*a*, 41*a*, 43*a*, 45*a*, 48*a*, 51*a*, 53*a*, and 54*a* are stars which should have been inserted in the talogue, or which were mis-identified therein; the remainder are new, those found by Prof. See and the stars found at the Cape being otherwise unpublished.)

No. 1*a*. Innes 311. Lac. 700. MAG. 8.4
2h 1m 48s —82° 46′.6
8.9 and 9.4

1898.9	45°. ±	1″.5 ±	Innes	1 n

The pr. star of a triangle in the finder field.

No. 2*a*. Cordoba [75]. Lal. 10,169. 7.3
5h 19m 25s —22° 24′.0.
Marked "dpl" in the C. G. A.

No. 3*a*. Hough 513. Lal. 11,802. 8.5
6h 6m 24s —20° 19′.9.
8.7 and 10.2

1898.2	355°.8	1″.34	Hough	1 n

No. 4*a*. Cape 23. C. Z. 6 h. 499. 8.5
6h 11m 49s —49° 4′.8.
8.9 and 9.7

1899.2	50°. ±	4″. ±	Innes	1 n

Found by Mr W. H. Cox with the Transit Circle.

No. 5*a*. H. N. 123. π Canis Majoris. 4.5
6h 51m 17s —20° 0′.5.
Comes = 10

1897.8	1°.3	11″.8	See	1 n

No change.

No. 6*a*. Hough 517. Lal. 13,486. 7.0
6h 52m 40s —19° 18′.3.
Comes = 13.0

1890.1	330°. ±	3″. ±	Hough	1 n

No. 7*a*. Harvard . . . Lac. 2710. MAG. 5.8
7h 11m 54s —46° 40′.4.
Double:—vide *Harvard Circular*, No. 18.

No. 8*a*. Innes 312. Lac. 2846. 7.7
7h 18m 41s —75° 41′.1.
8.4 and 8.5

1899.1	330°. ±	0″.9 ±	Innes	1 n

A 9.6 mag. star N.f. = C. P. D. – 75°, 438.

No. 9*a*. Harvard 114. Ö.A. 8200. 8.6
8h 8m 0s —23° 52′.5.
8.8 and 10.3

1870.2	333°.0	2″. ±	Harvard	1 n
1898.2	260.7	1.67	See	1

Taken from the list of Rejected Stars on page 242A, but the identification is uncertain.

No. 10*a*. Cordoba [76]. C. Z. 8 h. 995. 8.2
8h 13m 6s —34° 32′.9.
8.8 and 9.1

1897.5	135°. ±	3″. ±	Innes	1 n

No. 11*a*. Innes 194. C. Z. 8 h. 1367. 9.0
8h 17m 2s —59° 52′.9.
9.4 and 10.4

1897.3	135°. ±	1″.8 ±	Innes	1 n

The brighter and more southern of two stars in the field.

In the finder:—between two pairs of stars.

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MAG.

No. 12*a*. Hough 526. C. P. D. —26°,3323. 9.6
8h 18m 14s — 26° 9′.5.

Both = 10.4

1890.3	84°.6	1″.34	Hough	1 n

Lac. 3283, mag. 6.5, is 8′ N., and 22 secs. f.

No. 13*a*. Innes 313. Lac. 3372. 7.2
8h 27m 13s — 41° 10′.7.

7.4 yellow and 9.4 bluish

1899.4	220°.±	4″.±	Innes	1 n

No. 14*a*. Cordoba [77]. C. Z. 8 h. 2389. 8.2
8h 29m 18s — 50° 37′.8.

8.5 yellow and 10.0 bluish

1880.2	159°.1	11″.5	Cordoba	3 n
1899.1	100.±	4.±	Innes	1

No. 15*a*. Innes 314. Lac. 3456. 6.7
8h 35m 33s — 36° 15′.3.

6.8 and 9.8

1899.4	240°.±	0″.9±	Innes	1 n

No. 16*a*. λ . . . . . C. G. A. 11,753. 9.5
8h 37m 7s — 52° 41′.8.

. . . . . .

Prof. See:—Apparently dpl. in 120°, 0″.28.

Lac. 3476, mag. 6.0, is about 15″ S.pr., and with the above star forms the old pair *h* 4126.

No. 17*a*. Hough 529. Ö.A. 8877. 7.6
8h 37m 31s — 17° 4′.3.

Both = 8.4

1894.2	343°.0	0″.44	Hough	1 n

No. 18*a*. Innes 315. C. Z. 8 h. 3089. 8.5
8h 38m 26s — 42° 14′.3.

9.1 and 9.4

1898.4	160°.±	1″.±	Innes	1 n

C. Z. 8 h. 3082, mag. 9.0, is 5 secs. pr.

MAG.

No. 19*a*. Innes 316. C. Z. 8 h. 4047. 9.0
8h 50m 38s — 42° 5′.6.

Comes = 9.8

1898.4	300°.±	1″.8±	Innes	1 n

Colour? C. P. D. mag. = 10.4.

No. 20*a*. Innes 317. Bris. [2267]. 8.5
8h 51m 33s — 43° 5′.0.

8.7 and 10.2

1899.4	300°.±	1″.8±	Innes	1 n

No. 21*a*. Innes 318. b_2 Carinæ. 5.2 Yellow
8h 56m 57s — 58° 42′.0.

Comes = 11.5

1899.4	20°.±	30″.±	Innes	1 n

Retained on account of the p.m. of the chief star, viz.: 0″.29 towards 327°.0.

No. 22*a*. Innes 319. C. P. D.—82°,305. 9.1
9h 10m 22s — 82° 37′.2.

9.7 and 10.0

1899.4	100°.±	2″.±	Innes	1 n

C. P. D. – 82°,304, mag. 9.0, is 60″ ± N.pr., and C. P. D. – 82°,302, which is about 7′ S.pr., has a *comes*, 11th mag., 270°.±, 5″.±.

No. 23*a*. Innes 320. Gilliss P. Z. 6390. 8.6
9h 36m 20s — 66° 14′.7.

9.1 and 9.5

1899.0	65°.±	0″.8±	Innes	2 n

This pair is 2′ S.pr. Gilliss P. Z. 6395, mag. 8.8, which has a distant *comes*.

Mags. from the C. P. D.

No. 24*a*. Innes 321. Gilliss 1129. 9.3
9h 36m 52s — 58° 49′.0.

Both = 10.1

1899.4	210°.±	1″.±	Innes	1 n

Mag. from C. P. D.

Closely N.pr. Gilliss 1130, mag. 8.0.

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No. 25*a*. Cordoba [78]. C. Z. 9 h. 3385. MAG. 9.0
$9^h\ 44^m\ 49^s$ — 44° 26′.1.

9.5 and 10.1

1899.4	100.° ±	1.″2 ±	Innes	1 n

No. 26*a*. Innes 322. C. P. D.—61°,1383. 9.0
$9^h\ 55^m\ 23^s$ — 62° 4′.9.

9.7 and 9.8

1898.4	N.f.	1.″ ±	Innes	1 n

Closely N.f., Lac. 4109, mag. 7.5.

No. 27*a*. Hough 531. 1st Munich 5164. 8.0
$10^h\ 15^m\ 4^s$ — 3° 50′.5.

8.1 and 10.7

1894.3	133.°4	2.″03	Hough	2 n

No. 28*a*. Aitken. Lal. 21,535. 8.7
$11^h\ 11^m\ 44^s$ — 4° 36′.4.

9.3 and 9.7

1899.3	339.°4	0.″67	Aitken	3 n

Aitken also sees a 14th mag. 37″.5 distant, 7°.5.
(*Pub. Ast. Soc. of the Pacific*, No. 68, p. 128.)

No. 29*a*. λ . . . . . B. D.—16°,3400. 9.4
$12^h\ 4^m\ 28^s$ — 17° 1′.0.

and

1898.4	305.°9	1.″24	See	1 n

B. D. – 16°,3399, mag. 9.1, is 23″ N.pr., and with the above pair forms the old pair *h* 1212.

No. 30*a*. Innes 323. C. Z. 12 h. 1236. 8.5
$12^h\ 21^m\ 23^s$ — 76° 6′.7.

9.2 and 9.3

1899.4	142.° ±	2.″ ±	Innes	2 n

The N.f. of two stars.

No. 31*a*. Innes 324. Gilliss P. Z. 8791. 8.5
$12^h\ 36^m\ 59^s$ — 83° 6′.8.

9.0 and 9.5

1898.9	270.° ±	3.″ ±	Innes	1 n

No. 32*a*. Triple. C. Z. 14 h. 602. MAG. 8.7
$14^h\ 11^m\ 16^s$ — 68° 10′.2.

A = 8.7 B = 9.5 C = 10.0
A and B

1899.5	60.° ±	48.″ ±	Innes	1 n

Innes 325 = B and C = C. P. D. – 68°,2106

1899.5	230.° ±	3.″ ±	Innes	1 n

No. 33*a*. Innes 326. Lac. 5902. 7.2
$14^h\ 21^m\ 22^s$ — 75° 49′.6.

7.4 and 10.0 bluish

1898.7	123.°6	2.″03	Innes	1 n

No. 34*a*. α Centauri.

(No. 59 of 14^{hrs} on page 134 A.)

In observing this pair, with the 18-inch McClean refractor, on the 7th June 1898, the writer noticed a *comes* of the 11.3 mag. considerably closer than any star previously found.

From A (the brighter star) it was estimated

225° 50″

and from B (the lesser star)

250° 36″

Mr J. Lunt also picked up an 11.0 mag. *comes*, distant 80″, direction 40° from A.

The two large stars were absolutely round on the above occasion.

The great p.m. of α Centauri will soon show if these faint stars form a part of the system.

No. 35*a*. Hough 546. W. B. 14 h. 787. 8.3
$14^h\ 44^m\ 46^s$ — 6° 45′.0.

8.4 and 11.0

1897.4	91.°0	2.″82	Hough	2 n

No. 36*a*. Innes 327. C. Z. 14 h. 2950. 8.0
$14^h\ 48^m\ 33^s$ — 66° 27′.9.

Comes = 10.5

1899.5	100.° ±	3.″ ±	Innes	1 n

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No. 37*a*. Innes 328. Gilliss P. Z. 10,411. MAG. 9.0
14h 49m 5s — 84° 46′.2.

9.5 and 10.0

1899.4 170.° ± 1.″5 ± Innes 1 n
The estimated mags. were 8.5 and 9.0.
There is a bright star 23′ N.

No. 38*a*. Harvard. Piazzi 14 h. 204. 5.3
14h 49m 36s — 33° 26′.9.

According to *Harvard Circular*, No. 18, this is a triple system.

No. 39*a*. Innes 329. Lac. 6241. 6.6
15h 5m 53s — 60° 57′.9.

6.8 and 8.3

1898.7 329.°6 0.″5 ± Innes 1 n
A more distant *comes* N.pr. = C. P. D.–60°, 5679, mag. = 9.0.

No. 40*a*. Innes 330. C. Z. 15 h. 285. 8.0
15h 6m 52s —74° 12′.3.

8.5 and 9.0

1899.4 10.° ± 1.″ ± Innes 1 n
Lac. 6252, mag. 6.8, is N.f.

No. 41*a*. Innes 331. C. Z. 15 h. 443. 8.0
15h 8m 41s — 68° 12′.6.

8.3 and 9.8

1898.4 5.° ± 1.″7 ± Innes 1 n
N.pr. and in the field with γ Triang. Austr., mag. 3.0.

No. 42*a*. Innes 332. Lac. 6268. 6.6
15h 11m 32s — 67° 7′.0.

6.7 and 9.7

1898.4 95.° ± 1.″2 ± Innes 1 n
C. Z. 15 h. 651, mag. 8.5, is 9 secs. f.

No. 43*a*. λ 244. Bris. 5429. MAG. 7.9
15h 35m 30s — 31° 31′.5.

8.3 and 9.3

1897.4 29.°3 0.″89 See 1 n

No. 44*a*. Innes 333. Lac. 6484. 6.7
15h 45m 58s — 77° 43′.9.

7.3 and 7.6

1898.7 311.°2 0.″65 ± Innes 1 n
The p.m. is insensible.

No. 45*a*. Russell 269. C. Z. 15 h. 3258. 8.7
15h 48m 46s — 65° 27′.2.

9.2 and 9.7

This position is to take the place of that given on p. 153A, No. 99.

Russell 268 = C. Z. 15 h. 3228, mag. 8.5, a wide pair, is 18′ N.pr. in the same field.

The positions given by Mr Russell are much in error.

No. 46*a*. Innes 334. C. Z. 15 h. 3581. 9.0
15h 53m 41s — 71° 37′.1.

Comes = 11.0

1899.4 140.° ± 1.″5 ± Innes 1 n
Estimated mags. were 8.0 and 10.0.
The pr. of 3 stars, the brightest and S.f. star being Lac. 6591, mag. 7.0.

No. 47*a*. Washburn 126. B. D. −20°,4379. 8.9
15h 54m 45s — 20° 10′.1.

9.1 and 11.1

1898.5 36.°0 2.″65 See 1 n
Washburn 125, a pair of 9–10 mag. stars, 3.″4 apart, is 35 secs. pr. 2′ N.

No. 48*a*. Innes 335. C. Z. 16 h. 443. 8.5
16h 8m 50s — 71° 12′.1.

9.0 and 9.7

1899.5 200.° ± 2.″5 ± Innes 1 n
There are some signs of a p.m. in R.A.

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No. 49*a*. Innes 336. Lac. 6831. MAG. 7.4
16h 22m 51s — 62° 4′.3.

8.1 and 8.2

1898.7	5.°4	1.″ ±	Innes	1 n

The pr. star of a triangle.
A coarse pair is in the same field.

No. 50*a*. h. 4865. C. P. D.—83°,611. 8.9
16h 41m 7s — 83° 49′.8.

9.3 and 10.3

1835.4	314.°4	2.″ ±	*h*	1 n
1899·6	310.° ±	4.″ ±	Innes	1

This neat pair was omitted from the Catalogue on account of Mr Russell's remark in the *Sydney Observations*:— "1872, July 20. Two 8m stars here; neither has a close companion; the following star has two distant companions." These two stars are about 20′ S. of *h*'s position.

No. 51*a*. λ . . . . . Yarnall$_3$ 7144. 8.3
16h 51m 45s — 30° 4′.0.

and

1898.3	189.°8	1.″33	See	1 n

A 10th mag. star is 19″ f., and with the new pair forms *h* 4903.

No. 52*a*. Cape 24. C. Z. 17 h. 2676. 8.6
17h 41m 16s — 44° 59′.6.

9.0 and 10.0

1896.8	315.° ±	2.″ ±	Innes	1 n

Found by Mr R. T. Pett at the Transit Circle.

No. 53*a*. Sellors 13. C. Z. 18 h. 309. 8.5
18h 6m 11s — 35° 14′.0.

8.9 and 9.9

1891.7	43.°7	1.″5 ±	Sellors	1 n

No. 54*a*. Barnard. Lal. 34,422 MAG. 8.2
18h 30m 55s — 12° 3′.7.

8.6 and 9.4

1895.6	130.°3	0.″24	Barnard	3 n
1898.5	123.5	0.32	Aitken	3

No. 55*a*. Hough 88. 1st Munich 17,346. 9.0
18h 40m 33s — 9° 34′.7.

Both = 9.8

1885.6	208.°1	2.″03	Hough	1 n
1895.6	208.6	1.96	„	1

No. 56*a*. Schjellerup. Lal. 37,426. 8.7
19h 38m 7s — 9° 18′.3.

9.1 and 10.1

1895.2	308.°3	2.″36	Hough	2 n

Also registered as Hough 579. There is a 9.5 mag. star 61″ S.f.

No. 57*a*. Triple. Gilliss P. Z. 14,669. 8.9
20h 45m 25s — 87° 27′.0.

A = 9.3 B = 10.2 C = 9.1
Innes 337 = A and B

1898.9	270.° ±	1.″2 ±	Innes	1 n

h 5192 = A + B and C = Gilliss P.Z. 14,664

1837.8	327.°0	22.″ ±	*h*	2 n
1871.2	327.6*	18.1	Russell	2
1879.8	325.5	18.2	Hargrave	1

Gilliss P.Z. 14,770, mag. 8.8, is S.f.

No. 58*a*. Innes 338. C. Z. 21 h. 1645. 8.0
21h 54m 3s — 56° 57′.0.

8.2 and 9.7

1898.6	270.° ±	0.″8 ±	Innes	1 n

In the field with the large p.m. star, ε Indi, orange-yellow, mag. 4.8 (C.P.D. mag. = 6.7).

No. 59*a*. Innes 339. C. Z. 22 h. 117. 8.5
22h 5m 49s — 75° 29′.4.

9.0 and 9.6

1898.9	180.° ±	2.″ ±	Innes	1 n

The pr. of a row of four stars in the finder.

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No. 60*a*. Innes 340. Lac. 9268. MAG. 6.0
22h 45m 41s — 63° 43′.0.

6.1 and 9.1

1898.9	20.°	1.″3 ±	Innes	1 n

The p.m. of the chief star is 0″.052 towards 194°.9. The C.P.D. mag. is 7.2.

No. 61*a*. Cape 25. C. P. D.—45° 10,474. MAG. 8.2
23h 41m 27s — 45° 36′.8.

Both = 9.0

1898.7	155.°	1.″5 ±	Innes	1 n

Found by Mr W. H. Cox at the Transit Circle.

The addition of the five following wide pairs is suggested by the change since the time of Sir John Herschel's *Cape Observations*. The later measures are all by Professor T. J. J. See.

No. 1*b*. h. 3845. Piazzi 6 h. 59. MAG. 7.0 Orange
6h 12m 51s — 22° 40′.3.

Comes = 9.6

1836.1	51.°5	25.″ ±	*h*	2 n
1898.1	21.3	35.0	See	1

The change is due to the p.m. of the large star.

$\alpha = +0^s.007 \quad \delta = -0''.26$

The *comes* is C.P.D. − 22°, 1141.

No. 2*b*. h. 3938. Lal. 14,105. 6.8
7h 9m 35s — 22° 44′.0.

7.1 and 8.5

1837.1	252.°6	18.″ ±	*h*	1 n
1898.2	235.7	13.8	See	1

This change is not accounted for by the p.m. of the chief star, which is only

$\alpha = +0^s.002 \quad \delta = +0''.02$

The fainter star has only been observed on the meridian at Cordoba in 1877.

No. 3*b*. h. 4003. Ö.A. 4003. 9.2
7h 43m 40s — 23° 56′.3.

Comes = 9.7

1837.1	127.°8	15.″ ±	*h*	1 n
1898.2	119.4	30.8	See	1

The scanty meridian observations of the chief star bear out a p.m. which would account for the change shown, viz. :—

$\alpha = +0^s.02 \quad \delta = +0''.08$

but this p.m. is very poorly determined.

No. 4*b*. h. 4410. Ö.A. 11,162 MAG. 7.9
11h 3m 17s — 15° 25′.1.

Comes = 12.0

1836.4	205.°3	15.″ ±	*h*	1 n
1898.3	220.5	20.8	See	1

The change may be due to p.m., but this star has only been observed on the meridian once.

No. 5*b*. h. 4907. Ö.A. 16,183. 8.8
16h 53m 53s — 24° 3′.1.

9.3 and 9.8

1837.5	49.°1	15.″ ±	*h*	1 n
1898.5	40.4	8.04	See	1

The scanty meridian observations indicate a p.m. of the chief star in the sense shown by the micrometrical measures.

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ADDENDA:—II.

RECENT MEASURES.

Professors T. J. J. See and Eric Doolittle, with the greatest kindness, forwarded lists of their recent and so far unpublished measures of Southern Double Stars. A great number of these measures will be found below. They are very opportune, and, in a great many cases, enable us to say if the pair measured is in motion or fixed.

Professor See's measures were made at the Lowell Observatory with the 24-inch Clark refractor, and, as a rule, are the means of two separate sets of observations taken on one night. Professor Doolittle's were made at the Flower Observatory, Philadelphia, with an 18-inch refractor by Brashear.

The numbers in the first column refer to the Reference Catalogue. The remarks were added here.

No. in Catalogue.	Name.	Date.	Pos. Ang.	Distance.	Observer.	Nights.	Remarks.
0h No. 11	β 393	1897.7	18.° ±	0.″3 ±	See	1	"Not separated." See.
17	h 1964	1897.7	114.1	7.31	,,	1	Misidentified? as Lal. 552 by Prof. See.
21	h 1968	1897.7	109.8	2.40	Doolittle	2	A and B.
		1897.7	121.9	93.33	,,	3	A and C, and we have also the old measure.
		1891.8	121.3	93.36	β	3	See note.
1h No. 21	h 2036	1897.8	13.0	1.71	Doolittle	3	
4h No. 33	β 746	1898.1	13.0	1.23	See	1	
36	β 747	1898.1	219.1	3.79	,,	1	
37	β 185	1898.2	236.4	3.09	,,	1	
40	β 1236	1898.2	115.9	1.24	,,	1	Change?
42	α Cæli	1898.1	113.6	4.60	,,	1	*Comes* = 14m.
48	β 312	1898.1	344.7	3.26	,,	1	Fixed.
63	β 314	1898.2	329.2	0.98	,,	1	Fixed. Common p.m.
5h No. 14	Rigel's Companion	1879.69	126.0	...	β	5	Omitted from Catalogue.
		1894.25	183.0	...	Brenner	1	*Astr. Nachr.*, No. 3559.
		1895–6	Round		,,	....	
		1898.86	177.8	0.16	Aitken	3	*Pub. A. S. of the Pacific*, No. 66., pp. 45–6.
19	Howe	1898.2	232.6	2.45	See	1	Fixed.
26	h 3750	1898.2	280.0	4.35	,,	1	h's angle erroneous? Fixed.
28	Washburn 73	1898.2	51.3	3.13	,,	1	
35	β 319	1898.1	227.7	4.26	,,	1	
47	α Leporis	1898.1	157.0	35.26	,,	1	
49	h 3770	1898.2	20.3	4.17	,,	1	
65	β 321a	1898.2	143.1	0.86	,,	1	No change in either.
66	β 321b	1898.2	358.8	1.43	,,	1	See note.
68	β 322	1898.1	103.4	2.76	,,	1	
70	α Columbæ	1898.2	13.3	8.10	,,	1	*Comes* = 13.8 mag.

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No. in Catalogue.	Name.	Date.	Pos. Ang.	Distance.	Observer.	Nights.	Remarks.
5h No. 74	γ Leporis	1897.7	349°.5	96″.23	Doolittle	5	Common p.m.
94	South 504	1898.2	69.4	3.74	See	1	
95	Innes 155	1898.1	19.6	1.98	,,	1	
97	*h* 3823	1898.1	113.6	3.01	Doolittle	3	
6h No. 1	*h* 3831	1898.2	132.6	3.12	See	1	
2	Argelander [1]	1898.2	293.7	4.70	,,	1	No change.
12	β 1017	1898.2	159.2	0.67	Doolittle	4	Angle decreasing?
16	β 567	1898.1	242.4	4.41	,,	2	Slight change.
21	Hough 338	1898.2	290.2	2.92	See	1	
22	Σ 3116	1898.1	23.3	4.28	Doolittle	3	Fixed.
24	β 568	1898.2	158.8	0.58	See	1	Probably no change in this close pair.
25	β 97	1898.2	260.7	1.20	Doolittle	3	Fixed.
26	β 569	1898.1	115.5	2.07	,,	3	Fixed?
33	β 753	1898.2	43.1	1.14	See	1	Fixed?
34	*h* 3863	1898.2	119.0	2.62	,,	1	No change.
35	*h* 3866	1898.2	135.9	4.34	,,	1	Fixed.
38	β 98	1898.1	142.6	0.88	Doolittle	3	No certain change.
41	Innes 178	1898.2	225.3	0.36	See	1	
49	β 19	1898.2	165.2	3.92	,,	1	Fixed.
50	β 195	1898.2	212.9	5.98	,,	1	Another star, 34″.
54	Sirius	1898.3	168.4	4.82	,,	2	
		1898.3	170.0	4.67	Boothroyd	2	
55	Innes 179	1898.2	223.1	4.35	Hough	2	Measured as Hough 516. See note.
60	O. Stone...	1898.2	141.6	2.60	See	1	
62	β 20	1898.2	31.3	3.42	,,	1	
63	A. Clark 4	1898.3	290.6	0.84	,,	1	Probably no change.
66	β 324	1898.1	203.3	1.93	Doolittle	3	Fixed. Doolittle adds a 13th mag. star, 2°.4, 30″.3.
		1898.1	203.4	2.60	See		
68	β 898*a*	1898.2	266.8	2.11	,,	1	Some change?
69	β 898*b*	1898.2	354.8	3.40	,,	1	
74	β 325	1898.1	30.3	1.79	Doolittle	3	Angles discordant.
80	O. Stone...	1898.1	98.0	3.77	See	1	Fixed.
7h No. 18	Hough 344	1898.1	4.0	1.64	,,	1	Change?
22	Lalande...	1898.2	60.3	27.74	Doolittle	3	Change indicated.
24	τ Canis Majoris	1898.1	92.2	8.42	See	1	Very slow increase in angle.
26	*h* 3949	1898.2	75.8	2.81	,,	1	
28	Lalande 53	1898.2	346.8	4.00	,,	1	Fixed.
40	β 199	1898.2	20.7	1.71	Hough	1	A and B.
		1898.2	120.2	6.10	,,	1	A and C. New.
43	O. Stone....	1898.2	75.7	5.06	See	1	
45	β 578	1898.2	46.8	2.30	,,	1	Angle decreasing?
52	Howe 7	1898.2	203.2	2.19	,,	1	No change.
58	Argelander [2]	1898.2	332.7	3.46	,,	1	
64	Washburn 91	1898.2	215.1	2.10	,,	1	
74	ξ Argûs	1898.2	223.9	4.3 ±	,,	1	Motion 35° in 9 years.
99	β 333	1898.2	36.8	1.62	Doolittle	2	Angle decreasing?
8h No. 10	Hough 352	1898.3	184.7	5.99	See	1	
12	O. Stone....	1898.2	260.7	3.38	,,	1	Fixed.
21	Innes 193	1898.3	103.5	2.59	,,	1	The only measure.
23	β 454	1898.3	16.0	2.49	,,	1	
27	β 905	1898.2	14.5	3.94	,,	1	
31	β 906	1898.3	188.1	3.43	,,	1	Fixed.
48	β 205	1898.2	62.5*	0.75	,,	1	Binary.
51	β 206	1898.2	280.2	1.93	,,	1	Fixed.
53	β 207	1898.2	101.5	4.47	,,	1	Probably fixed.

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No. in Catalogue.	Name.	Date.	Pos. Ang.	Distance.	Observer.	Nights.	Remarks.
8h No. 67	β 586	1898.2	56.9	0.″63	See	1	This close and difficult pair is evidently fixed.
71	Hough 356	1898.2	270.2	1.46	,,	1	Change?
73	h 4143	1898.2	130.3	3.41	,,	1	Fixed.
85	β 103	1898.2	71.0	3.11	Doolittle	3	Perhaps slow change.
9h No. 7	β 410	1898.2	163.7	2.13	See	1	Fixed?
10	β 336	1898.2	236.3	1.92	Doolittle	3	Fixed.
		1898.2	236.7	1.85	See	1	
25	h 4200	1898.3	70.7	3.70	,,	1	
26	Innes 170	1898.3	36.1	1.32	,,	1	
37	β 339	1898.3	218.0	1.34	,,	1	Fixed.
54	Cincinnati	1898.3	266.5	2.98	,,	1	Prof. See also measures a star 24″ S.pr.
57	β 214	1898.2	258.8	3.55	,,	1	
62	Washburn 99	1898.3	212.8	2.09	,,	1	Change?
64	Innes 205	1898.3	22.0	2.04	,,	1	
65	h 4249	1898.4	123.3	4.28	,,	1	Fixed.
69	β 215	1898.3	346.0	1.72	,,	1	Fixed?
70	β 592	1898.3	193.0	9.95	,,	1	
72	β 216	1898.2	162.2	4.00	,,	1	Fixed.
10h No. 8	β 217	1898.2	282.0	1.90	,,	1	
10	β 218	1898.3	122.7	0.92	,,	1	Fixed.
11	β 911	1898.3	310.0	4.80	,,	1	Fixed, but common p.m.
17	Howe 13	1898.3	302.4	3.59	,,	1	
29	β 219	1898.2	187.7	2.77	,,	1	Fixed.
56	β 1075	1898.2	283.1	2.92	,,	1	Change?
61	Washburn 108	1898.2	25.3	1.14	,,	1	
72	,, 110	1898.3	274.6	2.42	,,	1	Fixed.
88	Innes 211	1898.2	180.1	1.89	,,	1	
89	Σ 1500	1898.3	311.8	1.94	Doolittle	3	Slow motion.
94	Howe 15	1898.2	336.2	2.67	See	1	
11h No. 5	β 220	1898.2	138.8	0.44	,,	1	Slow decrease in angle.
9	β 916	1897.2	354.5	0.72	Doolittle	1	
12	h 4423	1899.4	276.3	2.66	See	1	
21	γ Crateris	1897.4	96.7	5.15	Doolittle	3.	Very slow change with common p.m.
		1898.2	94.0	5.46	See	1	
27	β 601	1898.4	220.9	0.95	,,	1	Measures discordant.
39	Howe 16	1898.4	100.7	3.38	,,	1	
67	β 1079	1898.3	148.3	11.55	,,	1	No change since 1889.
68	β 457	1898.2	82.1	1.24	Doolittle	2	Increase in distance?
		1898.3	86.2	1.27	See	1	
12h No. 5	β 412	1898.4	162.5	2.35	,,	1	Fixed.
29	ζ Corvi	1898.4	42.5	4.36	,,	1	
39	β 606	1898.2	95.3	1.43	Doolittle	2	Angle decreasing.
40	β 922	1898.2	157.8	0.77	,,	2	Angle decreasing?
50	δ Corvi	1898.3	214.2	24.40	See	1	
55	Leavenworth ...	1898.3	31.9	1.60	,,	1	Fixed.
79	O. Stone....	1898.4	33.1	3.18	,,	1	
94	β 341	1898.3	135.4	0.65	,,	1	
13h No. 8	Washburn 174	1898.3	183.1	2.96	,,	1	
20	β 342	1898.4	34.7	4.23	,,	1	Fixed.
24	β 222	1898.3	14.6	1.80	,,	1	
31	β 610	1898.3	19.4	3.92	,,	1	No change.
34	β 460	1898.4	33.6	2.29	,,	1	
36	O. Stone....	1898.3	354.5	1.72	,,	1	Fixed.
39	β 1107	1898.4	136.2	0.94	,,	1	
58	Cape 14	1898.4	285.4	3.36	,,	1	The only measure.
62	Wilson ...	1898.3	66.1	2.27	,,	1	The only measure.
66	Howe 23	1898.5	187.2	1.64	,,	1	

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No. in Catalogue.	Name.	Date.	Pos. Ang.	Distance.	Observer.	Nights.	Remarks.
			°	"			
13h No. 82	γ Centauri	1898.3	83.3	1.22	See	1	Fixed.
95	h 2692	1898.2	320.6	3.48	Doolittle	3	Fixed.
97	β 344	1898.3	123.9	3.74	See	1	Fixed.
14h No. 1	β 938	1898.3	114.2	0.59	,,	1	
11	h 4661	1898.3	229.3	4.46	,,	1	Fixed.
15	β 939	1898.3	147.5	0.71	Doolittle	3	
18	h 1249	1898.4	164.0	5.27	See	1	Probably fixed. This is the first complete measure.
19	O.A. 13,520	1898.3	137. ±	0.25	,,	1	A and B = λ....
		1898.3	118.3	3.41	,,	1	A + B and C = Howe 28.
21	β 1246	1898.3	188.0	2.35	,,	1	The distant star (1898.3 38".5) is evidently not connected with the closer system.
24	Washburn 18	1898.3	354.5	3.51	,,	1	
27	Cordoba [34]	1898.4	208.9	1.87	,,	1	
34	β 225	1897.4	101.3	1.58	Doolittle	3	Fixed.
		1898.4	99.5	1.42	See	2	
38	Hough 386	1898.4	321.8	4.27	,,	1	
44	β 117	1898.4	93.0	2.24	Doolittle	4	
		1898.4	92.1	2.46	See	1	
50	Harvard...	1898.5	130.2	26.86	,,	1	Only measure published. This pair is so wide that it should be rejected.
58	β 804	1898.4	161.6	1.37	Doolittle	3	
60	β 226	1898.3	88.9	0.98	See	1	
62	β 805b	1898.3	241.7	1.95	,,	1	
76	Washburn 19	1898.5	196.5	1.40	,,	1	
87	β 346	1898.3	249.6	1.73	,,	1	Angle increasing.
90	μ Libræ	1897.3	343.6	1.84	Doolittle	2	Very slow motion.
92	h 4707	1899.5	130. ±	0.8 ±	Innes	1	Binary.
97	β 347	1898.3	319.5	13.90	See	1	Fixed.
114	Washburn 22	1898.3	1.2	2.30	,,	1	
15h No. 1	β 119	1898.5	303.4	1.63	Doolittle	3	
8	h 4740	1898.3	8.3	3.35	,,	4	Change shown; at present inexplicable.
14	β 618	1898.5	17.3	1.83	See	1	Angle decreasing.
30	h 4756	1898.5	321.4	1.05	Doolittle	2	Certain change. Binary?
65	β 121	1898.5	275.1	1.66	,,	2	Fixed.
69	β 122	1898.5	208.5	2.24	See	1	Angle increasing slowly.
76	β 354	1898.3	286.2	5.70	,,	1	Fixed.
83	β 620	1898.5	162.0	0.40	,,	1	Measures discordant.
110	β 37	1898.3	43.5	3.03	,,	1	No change.
111	β 38	1898.3	351.0	4.29	,,	1	No change.
118	Washburn 127	1898.3	130.5	2.26	,,	1	
16h No. 30	σ Scorpii	1898.3	271.8	20.67	,,	1	
31	β 624	1898.4	320.3	1.42	,,	2	Fixed.
32	h 4845	1898.3	135.5	2.25	,,	1	
33	h 4848	1898.3	153.6	6.31	,,	1	Fixed.
51	Σ 3105	1898.4	45.4	0.48	Doolittle	5	
91	Piazzi.....	1898.3	230.3	5.06	See	1	Fixed.
17h No. 34	o Ophiuchi	1898.3	354.0	10.64	,,	1	
37	β 126	1898.5	262.0	2.21	,,	1	Fixed.
85	β 631	1898.5	64.4	0.57	Doolittle	2	
123	τ Ophiuchi	1896.7	258.2	1.96	Morgan	4–3	

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No. in Catalogue.	Name.	Date.	Pos. Ang.	Distance.	Observer.	Nights.	Remarks.
			°	″			
18h No. 21	β 131	1898.5	277.3	3.20	See	1	Fixed.
30	β 285a	1898.7	318.6	1.63	Doolittle	3	Fixed.
31	β 285b	1898.7	18.0	1.99	,,	3	Fixed?
35	β 639	1898.5	355.±	elongated?	,,	3	Binary. p.m., $\alpha = -0^s.005$ $\delta = 0''.00$.
53	β 965	1898.6	106.4	1.44	,,	3	Is 1st Mun. 16,251. $18^h 21^m 7^s - 17° 15'.3$. *Comes* = 12.0.
63	β 419	1898.5	46.9	1.54	,,	3	Angles discordant.
71	β 967	1898.5	194.4	2.21	,,	3	Fixed.
19h No. 6	β 138	1898.7	277.2	1.05	,,	2	Fixed.
31	h 5120	1898.7	171.8	4.92	,,	2	Distance increasing.
53	β 827	1898.6	248.6	1.10	,,	5	Angle decreasing.
57	β 467	1898.6	133.5	3.07	,,	3	Fixed.
65	β 148	1898.7	321.4	0.95	,,	3	Angle decreasing.
20h No. 47	β 668	1898.7	26.4	4.66	,,	4	Common p.m. Fixed.
71	β 153	1898.7	274.2	1.38	,,	4	
78	β 154	1898.6	59.6	2.88	,,	3	Fixed.
92	β 678	1898.7	197.8	2.37	,,	3	Angle increases 3° in 5 years.

NOTES TO CATALOGUE AND ADDENDA.

0h No. 21. If C had been fixed, its distance should have decreased by 1″.5 through the p.m. of A; therefore A and C have common p.m. The mag. of C, taking the mean between β and Doolittle, is 10.8.

27. β Toucani. β_1 = pale yellow. β_2 = pale orange yellow. (*Journ. Brit. Astr. Assc.*, vol. viii., p. 28.)

5h Nos. 65 and 66. These form *h* 3780 (5 stars). The two close pairs were not distinguished by *h*.

6h Nos. 55 and 58. The measures of these two stars seem to be mixed.

7h No. 36. Is Hough 521.

13h No. 61. Chief star = 7.0 mag., yellow. 1899.60.

14h No. 43. Doolittle estimates the distant star (15″) as 9.8 mag.

14h No. 105. Mr W. de Sitter finds the parallax of this pair to be 0.″17 ± 0.″01, and the distance as follows:—

1898.59	16.″680	3 n
1899.11	16. 764	6
1899.60	16. 899	3

These distances, derived from the parallax observations, may be taken as accurate within about 0.″03.

16h No. 45. The colours should be Y^2 and BG^2. See *Journ. Brit. Astr. Assc.*, vol. vi. p. 419. Again verified, 1899.6, by H. Wright at Sydney, N.S.W.

16h No. 50. Not found on two nights (1899.4). There are several minute pairs under 3″ within 1° of the position given by Russell, and a wide pair will be found $2^m 15^s$ f. and 20′ N.

16h No. 53. There is no star as close as 20″. There is a 12th mag. star about 33″ distant.

17h No. 38. β 127 = C. Z. 17^h 897, mag. 7.7. Noted as double at Cordoba.

18h No. 45. Is Hough 566.

19h No. 50. Not found on two nights (1899.5).

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